SHOUT
SHARE
IT

SMITHSONIAN INSTITUTION LIBRARIES

SMITHSONIAN INSTITUTION LIBRARIES

PAXTON'S

MAGAZINE OF BOTANY.

PAXTON'S

MAGAZINE OF BOTANY,

AND

REGISTER OF FLOWERING PLANTS.

> God Almighty first planted a garden; and, indeed, it is the purest of human pleasures; it is the greatest refreshment to the spirits of man; without which buildings and palaces are but gross handiworks: and a man shall ever see, that, when ages grow to civility and elegance, men come to build stately, sooner than to garden finely; as if gardening were the greater perfection.—Lord Bacon.

VOLUME THE FIRST.

SMITHSONIAN INSTITUTION
FEB 6 1930
SPECIAL COLLECTIONS

LONDON:
ORR AND SMITH, PATERNOSTER ROW.

MDCCCXXXIV.

LONDON:

BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.
(LATE T. DAVISON.)

~~580.542~~
~~P34~~
v. 1
.D.S.
QK
1
P342
V.1,c.2
SCNHRB

TO THE MOST NOBLE

WILLIAM SPENCER CAVENDISH,

DUKE OF DEVONSHIRE, K.G., &c. &c.

This First Volume

OF

THE MAGAZINE OF BOTANY

IS,

WITH THE GREATEST RESPECT AND GRATITUDE, AND BY HIS GRACE'S KIND
PERMISSION,

MOST HUMBLY DEDICATED,

IN TESTIMONY OF

HIS GRACE'S ENTHUSIASTIC LOVE OF BOTANY, AND HIS EARNEST ENDEAVOURS TO
PROMOTE SCIENCE IN GENERAL;

AND ALSO

AS AN ACKNOWLEDGMENT OF THE INNUMERABLE FAVOURS
CONFERRED ON HIS GRACE'S

OBLIGED AND MOST OBEDIENT SERVANT,

JOSEPH PAXTON.

ADVERTISEMENT.

The object and design of the Magazine of Botany being stated at length in the Introduction, renders it needless to repeat them here. Yet the Author may be allowed to say, that as a guide to the lover of Flowers, both as regards culture and selection, he can, without fear of being charged with vanity, state that the work will be found valuable.

The Author has studiously endeavoured to render everything as plain and intelligible as possible. The botanical descriptions of the plants are therefore written in English, and, as much as possible, without the use of scientific terms.

The methods of culture are written in short paragraphs, to assist the memory; and these paragraphs are, in most cases, numbered, to render each easy of reference.

In the Calendars of work to be done in each month, no useless repetitions of the methods of culture are entered into; but after stating it to be the season for performing certain operations, reference is given to page and rule, where the mode is detailed.

The volume contains one hundred Illustrations in wood, cut by persons eminent in that branch of business.

The coloured plates, of which there are nearly fifty, were drawn and coloured by some of the first artists. The plants represented are all really valuable, and some of them entirely new.

The great and increasing demand for this work, which has far exceeded the Author's expectations, stimulates him, at the close of this first volume, to persevere in his humble but constant endeavours to render the Magazine of Botany a sure guide to every admirer and cultivator of FLOWERS.

CHATSWORTH,
Dec. 20, 1834.

WOOD-CUT ILLUSTRATIONS.

VOLUME THE FIRST.

GARDENS AND GARDEN STRUCTURES.

FLOWER GARDEN, 154, 184
Greenhouse, glazed on Mr. Saul's principle, 130
House for striking cuttings. Plan and section of one, 112
Hot-water apparatus on Mr. Saul's principle, 136
Pit for sheltering Auriculas, &c., 9
Public Subscription Gardens. Design for, 215
Surrey Zoological Garden, 185, 186
Witty's Patent Gas Furnace, 133

EDIFICES.

Cottages for ornament on Gentlemen's Estates, 251—255
Old English Gate Lodge, 178

OPERATIONS.

Abscission; propagation by, 92
Auricula seed; mode of sowing, 10
Budding; propagation by, 37
Camellias; new mode of propagating, 36
Flowers; mode of packing, 12
Grafting Camellias by approach, 36
Grafting Camellias by approach, new mode of, 36
Grafting, many modes of, 93
Glazing on Mr. Saul's principle, 130
Glazing on Mr. Harrison's principle, 131
Inarching, 36
Layers; propagation of Carnations by, 72
Layers; propagation of Oranges by, 92
Potting; peculiar method of, 6
Trees; method of removing large ones, 47
Trees, method of supporting without bands, 47

DIAGRAMS.

Lemon Fruit, 89
Piece of wood perforated by the Goat Moth, 48
Rafter on Mr. Saul's mode of glazing, 130

MACHINES, INSTRUMENTS, AND UTENSILS.

Basket for growing Orchideous Epiphytes, 15
Bygrave Plant Preserver, 17
Bygrave Slug Preventer, 17
Case of drawers, in which to keep Bulbous Roots, 44
Collar to support the flowers of Carnations, 71
Daisy Extractor, 274
Flattener of Florists, 11
Fumigator, 24
Garden Chair, 123, 220
Garden Scraper, 75, 76
Implements for removing large trees, 46
Labels for Plants, 124, 155
Lucas's Self-acting Force-pump, 156

Mouse-trap, 24
Musical Dial Fountain, 250
Orange Tub, 94
Pan for sowing small seeds, 10
Pliers used by Florists in transplanting small seedlings, 11
Propagating Pot, 92
Shade used by Florists for Auriculas and Polyanthuses, 10
Shade used by Florists for Carnations, 70
Stands for supporting Dahlias, 106, 107
Syringe, Siebe's new invented, 23
Transplanter or Dibber, for planting seedling Auriculas, 11

INSECTS.

Goat Moth, 48
Wire Worm, in its three stages of existence, 74

PLANTS.

Aerides paniculata, 15
Angræcum eburneum, 258
Aporum anceps, 155
Camellias, 36
Caralluma fimbriata, 216
Cacti, grafting of, 51
Cephalotus follicularis, 59
Cinnamon Tree, 147
Dionœa muscipula, 61
Dipsacus fullonum, 60
Francoa sonchifolia, 234
Frittillaria Meleagris, 17
Hermodactylus longifolia, 242
Lemon Tree, branch of, 89
Maxillaria picta, 228
Nepenthes distillatoria, 57
Octomeria graminifolia, 155
Oncidium bifolium, 234
Oxalis acetosella, 229
Potentilla Nepalensis, 170
Polyanthus, Geo. IV., 110
Pomegranate Tree, 65
Psidium Cattleyanum, 119
Rafflesia Arnoldi, 153
Rondeletia speciosa, 158
Sarracenia flava, 55
Schizanthus in a pot, 6
Scutellaria macrantha, 234
Smut on Roses, 146
Sparaxis lineata, 17
Tigridia pavonia, 85
Vieusseuxia glaucopis, 17
Zingiber Officinalis, 200

LATIN INDEX

TO

THE COLOURED FIGURES OF PLANTS.

ALSTRŒMERIA pelegrina alba, 199
Amaryllis formosissima, 149
Anomatheca cruenta, 103
Azalea Danielsiana, 129
Azalea pulchra, 126

Boronia serrulata, 173

Calceolaria bicolor, 246
Calceolaria integrifolia viscosissima, 269
Calochortus luteus, 221
Calochortus venustus, 175
Calandrinia grandiflora, 222
Cattleya intermedia, 151
Cratægus Oxyacantha rosea, 198

Epacris grandiflora, 52
Epiphyllum splendidum, 49

Francisea Hopeana, 80
Fuchsia globosa,

Gesneria Cooperi, 224
Gilia Achillæfolia, 150
Gilia tricolor, 150

Hibiscus Lindlei, 77

Ipomopsis elegans, 27
Ipomopsis picta, 245

Justicia coccinea, 102

Kæmpferia rotunda, 125

Malop trifida grandiflora, 177
Marica cærulea, 128
Marica Sabini, 81
Mimulus roseus, 29
Mimulus Smithii, 54
Mimulus variegatus, 79

Pæonia edulis Reevesiana, 197
Passiflora Kermesina, 25
Petunia violacea, 7
Phlox cordata grandiflora, 268
Rhododendron arboreum, 101
Rhododendron pulchrum, 126
Ribes sanguineum, 3

Schizanthus Priestii, 31
Schizanthus retusus, 5
Silene laciniata, 267
Streptanthera cuprea, 8

Tropæolum majus atrosanguineum, 176

Verbena Melindres, 173

Zinnia violacea coccinea, 223

ENGLISH INDEX

TO

THE COLOURED FIGURES OF PLANTS.

ALSTRŒMERIA, white variety of spotted flowered, 199
Anomatheca, blood-spotted, 103
Azalea, Mrs. Captain Daniels', 129
Azalea, pretty, 126

Boronia, saw-leaved, 173

Calandrinia, great-flowered, 222
Calochortus, beautiful, 221
Calochortus, yellow-flowered, 175
Cattleya, middle-flowered, 151
Currant, red-flowering, 3

Epacris, great-flowered, 52
Epiphyllum, splendid-flowering, 49

Francisea, one-flowered, 80

Galangale, round-rooted, 125
Gilia, three-coloured, 150
Gilia, milfoil-leaved, 150
Gesneria, Mr. Cooper's, 224

Hawthorn, dark rose-coloured, 198
Hibiscus, Mr. Lindley's, 77

Indian Cress, dark red, 176
Ipomopsis, painted flowered, 245
Ipomopsis, elegant flowered, 27

Jacobea Lily, 149
Justicia, scarlet-flowering, 102

Lychnidea, large flowered cordate, 268

Malope, great-flowered, 177
Marica, Captain Sabine's, 81
Marica, blue-flowering, 128
Monkey Flower, rosy-flowered, 29
Monkey Flower, Mr. Smith's, 54
Monkey Flower, variegated, 79

Passion Flower, crimson, 25
Petunia, purple-flowered, 7
Pæony, Reeves', 197

Rose Bay Tree, 101
Rose Bay, pretty flowered, 126

Schizanthus, blunt-petalled, 5
Schizanthus, Mr. Priest's, 31
Slipper wort, two-coloured, 246
Slipper wort, very viscous, 269
Streptanthera, copper-coloured, 8

Tacsonia pinnatistipula, 249

Vervain, scarlet-flowering, 173

Zinnia, scarlet flowered, 223

INTRODUCTION.

From time immemorial Flowering Plants have been objects of especial care and delight; but probably at no period was there a greater interest exhibited, both as regards the introduction of new ones, or the cultivation of those we already possess, than at the present. Botanical collections are to be found in almost every part of the globe, from the torrid regions of India to the cold and icy poles.

In consequence of these exertions great numbers of new plants are annually introduced; and in a few years, should these additions continue, our present extensive collections will appear comparatively scanty and meagre.

That these valuable introductions may be rendered of general utility, several splendid botanical works, containing coloured figures, are published periodically; and during the past year nearly two hundred new plants have been figured in them, some of which are exceedingly beautiful.

This regular annual increase, added to the stock already in this country (nearly thirty thousand), does not merely swell the size of our botanical catalogue, but renders indispensable the existence of a work which will be an unerring guide in the selection and nurture of such as are worthy of extensive cultivation; and yet of so low a price as to be within the reach of all classes.

This selection, it is true, might be made from the botanical works already in course of publication; but, it must be confessed, the high price of these places them beyond the reach of most flower cultivators: while the cheap periodicals, although unobjectionable in this respect, are manifestly defective in other points of greater importance; the plates they contain bearing but little resemblance to the plants they are intended to represent.

To obviate these objections, each Number of the Magazine of Botany will contain Four Engravings of Plants, of the natural size, beautifully coloured, from original Drawings. The letter-press will be illustrated by numerous Wood-cuts of Plans of Flower Gardens, Elevations of Garden Structures, Utensils and Instruments necessary for Florists and others who take delight in the cultivation of Flowers: and also of Figures representing the practical operations necessary for the proper management and full development of their several beauties; without which figures it is hardly possible to render intelligible the peculiar and requisite mode of operation.

The text will comprise Botanical Descriptions of the Plants figured; the Time of their Introduction; the best Mode of Culture; and every other particular essential to their perfect growth. Every beautiful plant, newly introduced, if considered worthy of notice and general cultivation, will be described, and, if of sufficient importance, accurately figured.

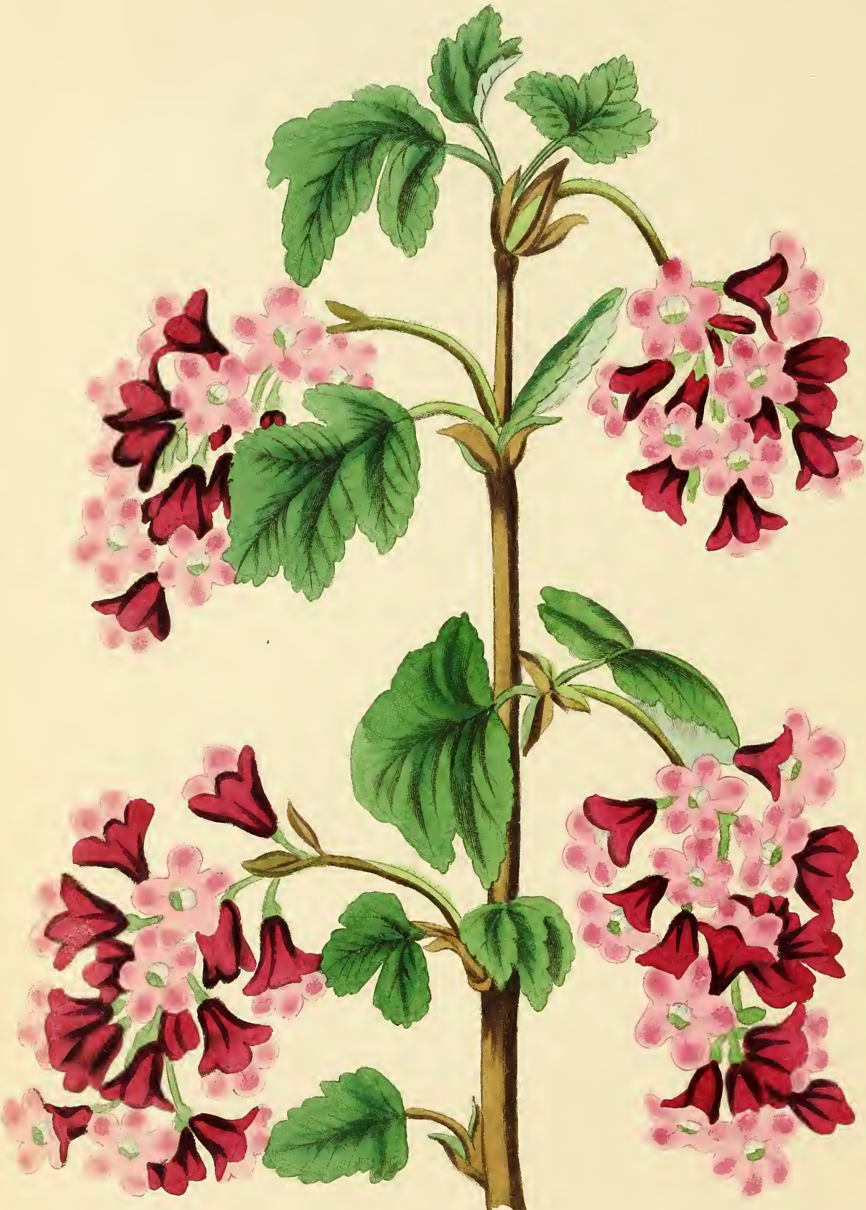
As great confusion often exists amongst cultivators, in consequence of our very eminent Botanists so frequently changing the names of Plants after their introduction, great care will be taken to constantly adhere to the names first given, if at all consistent. In some cases the change is indispensable.

Each Number will also contain a Calendar of the Work to be done in each Month in the Flower Garden, including Descriptions of all kinds of Insects which infest Flowers, with the most efficient methods for destroying them, or preventing their depredations; together with such other information as is requisite for the successful propagation of Plants.

The object of the author being to render the work practically useful, and one on which implicit reliance may be placed, the modes of culture recommended will be given from his own daily experience and observation. And as a medium of conveying sound practical instruction,—its utility increased by the beauty of its illustrations,—he hopes to render it deservedly popular with every one interested in this highly pleasing and interesting pursuit.

CHATSWORTH,
January, 1834.

DSI



Ribes sanguineum.

FEB. 1834.

RIBES SANGUINEUM.

(RED FLOWERING CURRANT.)

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
GROSSULACEÆ.

Generic Character.—*Calyx* superior, in 5 coloured divisions. *Corolla*, petals 5, inserted in the top o the calyx. *Stamina* 5, inserted opposite to the petals; *Anthers* compressed, and inclining. *Germen* simple; *style* 1; *Stigmas* 2; berry round, umbilicated, of one place, containing many seeds.—*Lindl. in Bot. Reg.*

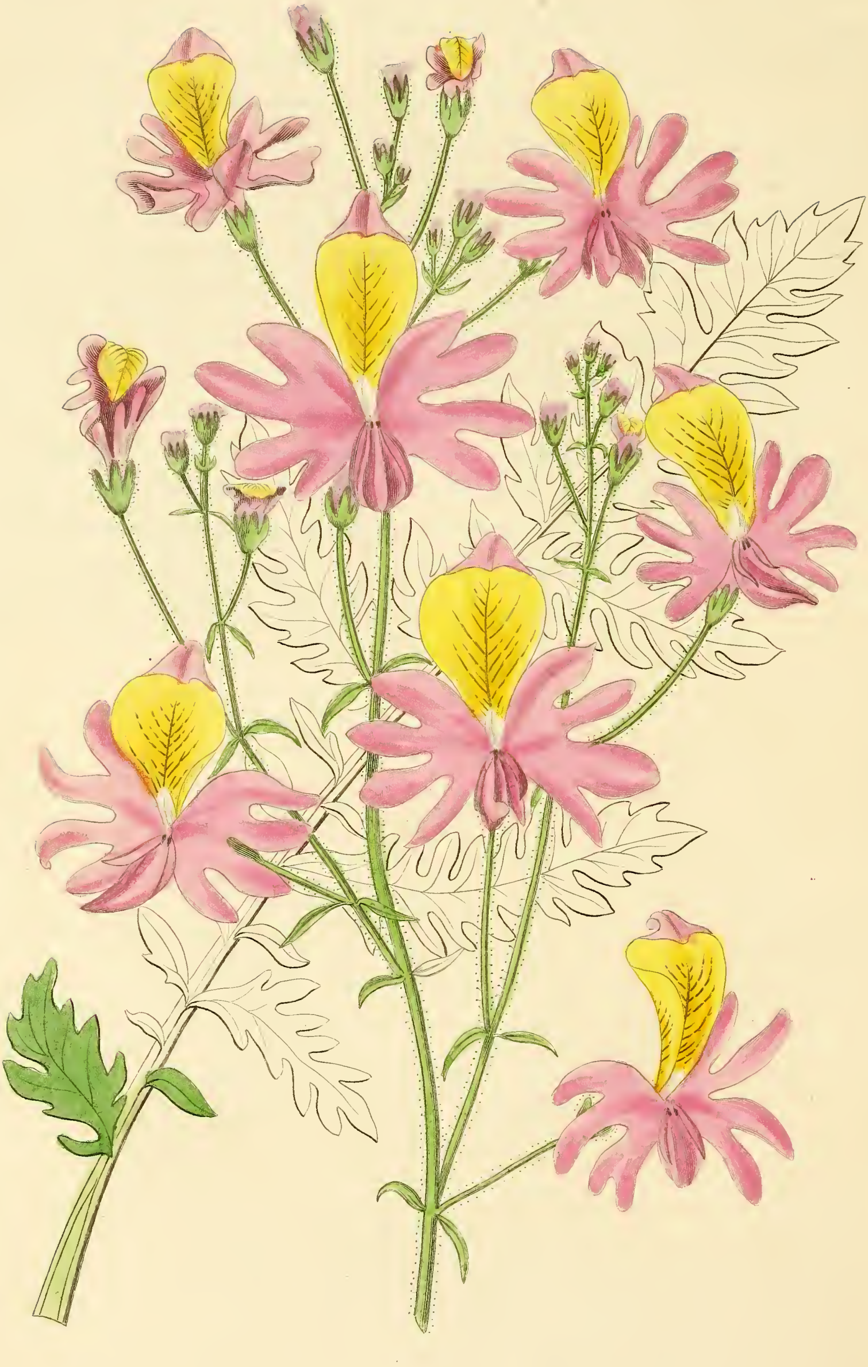
Specific Character.—Leaves heart-shaped of from 3 to 5 serrated lobes, linearly veined, rough, above hairy, downy white beneath; branches flexible and nodding; flowers aggregated; petals oblong; bractea ovally spatulate, somewhat longer than the footstalk; *ovarium* covered with glandular hairs.—*D. Don, in Brit. Flower Garden.*

This present species of Ribes far surpasses in beauty any of previous, or, we believe, of subsequent, introduction. It is a native of North-west America, and, according to Mr. Douglas, Archibald Menzies, Esq. discovered it near Nootka Sound in 1787, when on his first voyage round the world; and in 1792, on his second voyage with the celebrated Vancouver, he found it again in various parts of North-west America. From the time of its first discovery until its introduction in 1826, comparatively nothing was known of it in this country; but in the last mentioned time Mr. Douglas forwarded seeds to the Horticultural Society's garden. He says it usually grows on rocky situations, or on the shingly shores of streams, in partially shaded situations.

It is perfectly hardy, and nearly as easy of culture as the common currant bush of our kitchen gardens; it requires to be planted in a dry situation and a light soil, when it produces abundance of beautiful purplish-red flowers about the beginning of May, and continues flowering for two or three weeks successively. It is increased by cuttings, after the manner of the common currant, which should be planted in light sandy soil, either in September (which is probably the best time) or in spring. The colours of this, as well as many other plants, are subject to considerable variation, some bearing flowers of a light rosy colour, others of a dark carmine, and others with deep purple tints. These variations are evidently the effects of situation, soil, and other circumstances; this we are the more confirmed in by observing the flowering of some plants at Chatsworth the last year, and we think there is little doubt but the remark of Mr. Douglas, in the Transactions of the Horticultural Society, vol. vii. part 4, may be perfectly correct—" That if the bushes were planted in soil having a portion of lime rubbish mixed with it, the blossoms would be more profuse, and probably of a deeper colour;" a circumstance he states to have observed in the limestone districts of its native woods.

Previous to the introduction of this species, the *R. aureum* was the favourite of this genus; it is certainly a pretty shrub, though very far inferior to the *R. sanguineum.* Its very easy culture, thriving in almost any situation, its numerous racemes of bright yellow flowers, and the peculiarly pleasant fragrance they emitted when in perfection, rendered it a desirable inhabitant of our gardens. In North America, its native country, it is highly prized for its fruit, which is said to be of an excellent quality, and superior in size to any of our common garden sorts, although in this country it rarely, if ever, produces fruit at all.

The generic name *Ribes* originated in the supposition that our currant and gooseberry were the plants to which the Arabian physicians of the eleventh and twelfth centuries gave the name of *Ribas,* but which has since been discovered to be a kind of rhubarb, called *Rheum Ribes.* The specific name, *sanguineum,* alludes to the colour of the flower, being purple-red or blood-colour.



Schizanthus retusus.

FEB 1834

SCHIZANTHUS RETUSUS.

(BLUNT-PETALLED SCHIZANTHUS.)

CLASS. ORDER.
DIANDRIA. MONOGYNIA.

NATURAL ORDER.
SCROPHULARINEÆ.

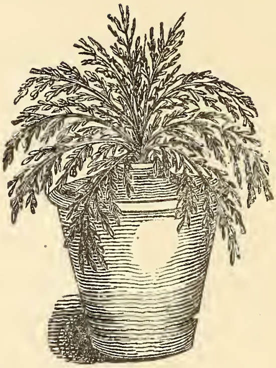
Generic Character.—*Calyx* 5-parted, somewhat unequal. *Corolla*, limb in 4 parts, lobed, irregular, plaited while expanding; *tube* narrow and short. *Stamina* 4, two upper ones barren, filaments all adnate. *Anthers* inserted below in two places, confluent at the top. *Ovarium* of 2 locaments placed on a smooth fleshy disk. *Stigma* compressed, obtuse, of 2 united lobes. *Capsula* of 2 places containing many seeds; valves divided. *Dissepiments* parallel. *Placenta* 2, spongy. Seeds simple, shell-like, having a hard wrinkled integument; albumen fleshy. Embryo arched; the rostel roundly obtuse and twice as long as the seed leaves.

Specific Character.—Fruit on footstalks erect; *Corollæ* tubes longer than the calyx; lips variously cut or slashed, middle one arrow-shaped, upper one somewhat square and abrupt.—*D. Don, in Brit. Flower Garden.*

This is without doubt the most strikingly beautiful species of Schizanthus that has yet appeared. We are indebted to Dr. Gillies for its introduction, who discovered it on the Chilian Andes, and sent seeds to the late Mr. Barclay, who raised the first plants in 1831 at Bury Hill. It is an annual of great beauty, and of tolerable easy culture, growing from seeds which ripen freely, if the plants be kept in an airy situation at the time of flowering.

Those intended for the principal flowering we would recommend to be sown the previous summer, or early in the autumn; and in February and March two more sowings should be made to succeed each other. The autumn sowings, or rather those of the previous summer, should be sown in the middle of July and beginning of August. Light rich mould is the most suitable for the purpose. As soon as the plants have formed two proper leaves, pot them in small sixty-sized pots, drained so as to allow the water to pass off freely. They should remain in these pots in a cool airy part of the green-house, or dry frame, during the winter; and about the beginning of March be shifted into pots a size larger, which shifting should be repeated as often as the roots reach to the sides of the pots. The soil should be composed of about equal parts of peat, well rotted dung, and light sandy loam.

Their roots are very tender, and easily injured; the first effects of injury visible, is the drooping of the leaves of the plants, as if for want of water, which is too often administered as a remedy: very shortly after drooping, the plant falls over the pot, the stem having cankered just above the soil. We have more than once experienced this; and as a remedy we recommend the pots to be very well drained, and the plants to be rather elevated in the centre of the pots, judicious waterings, and light soil.

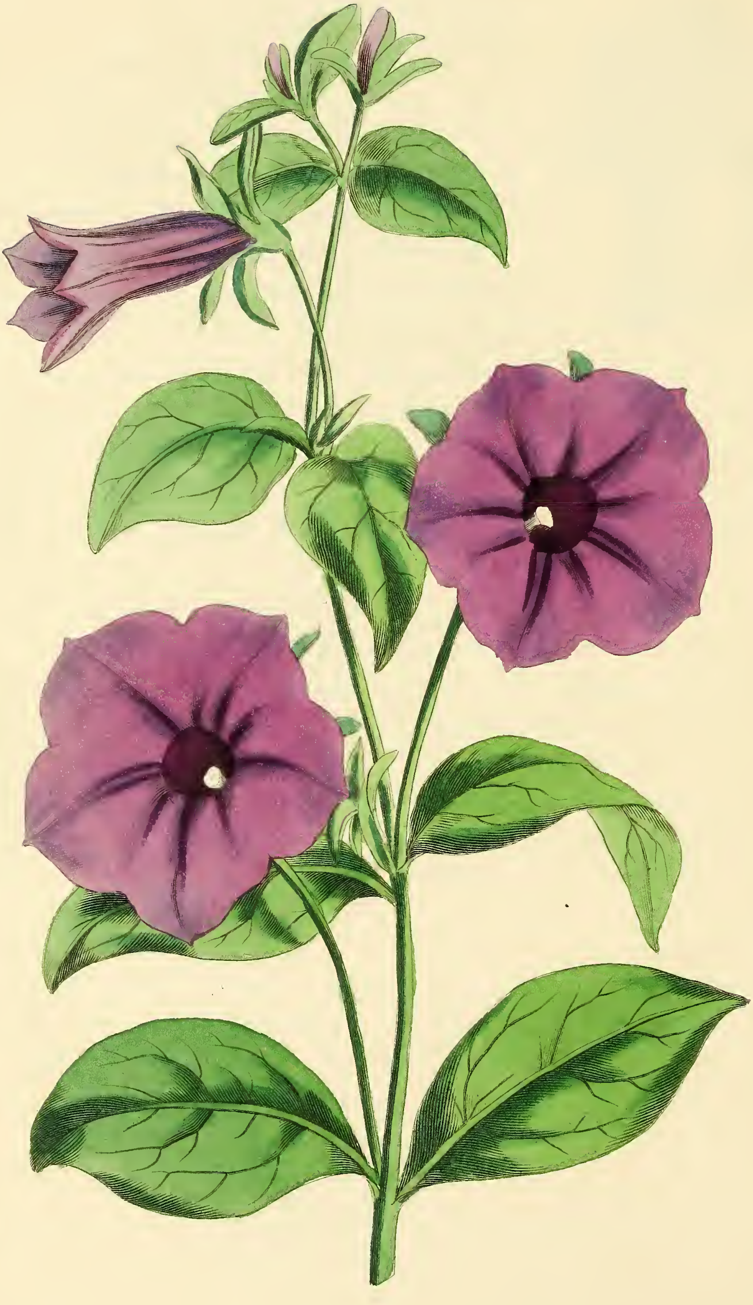


Last year we made a sowing in May, from which we grew extraordinary fine plants, but only a few of them flowered, and those indifferently ; we have, however, preserved about fifty fine plants, from which we anticipate a dazzling display of flowers in May or June. We kept them in a frame, and gave them abundance of air ; they were shifted into larger pots about every fortnight or three weeks ; and in September many of them threw up eight or ten fine flowering stems, but owing to the unfavourable weather in this part of the country, they did not come to perfection. We have not yet tried whether it will flower well in the open air, though we have little doubt but that it will grow equally well with other half-hardy annuals.

Mr. Hugh Cuming has lately discovered another beautiful sort, which is found to be a variety of the *pinnatus*, and is therefore named *pinnatus humilis ;* this and all the other species may have similar treatment to the *retusus*. If planted in the borders, always select situations where they will be dry and airy, but not exposed to strong winds.

The generic name is derived from the Greek words *schizo*, to cut, and *anthos*, a flower, alluding to the flowers having the appearance of being deeply cut.

J. P.



Petūnia violacea.

FEBy. 1834.

PETUNIA VIOLACEA.

(PURPLE PETUNIA.)

CLASS.	ORDER.
PENTANDRIA.	MONOGYNIA.

NATURAL ORDER.

SOLANEÆ.

GENERIC CHARACTER.—*Calyx*, shortly tubular, leafy, leaflets lacinated. *Corolla*, tube cylindrical, bellying, limb plaited and divided into 5 unequal lobes. *Stamina* 5 unequal, inserted in the middle and within the tube of the corolla. *Ovarium* on a disk having one tooth on each side. *Stigma* capitate. *Capsula* with 2 valves. Seeds spherical and netted.

SPECIFIC CHARACTER.—Stems prostrate, clammy and hairy; leaves oval, with short footstalks. *Corolla* bellying, lips cut into sharp divisions.—*Lindl. in Bot. Reg.*

THERE are few plants in our gardens which surpass this in brilliancy of blossoms and general beauty. It is a native of Buenos Ayres, from whence seeds were sent to the Glasgow Botanic Garden, in 1830, by Mr. Tweedie. It succeeds extremely well in the open border, during summer, but must be treated as a hardy green-house plant in winter; the flowers show to the greatest advantage if a whole bed be devoted to them, and where the branches are allowed to spread over the whole surface, and become entangled with each other. Under these circumstances the flowers will be produced from July until the end of October, or, at least, as long as the weather will permit. Some beds so planted at Chatsworth, last summer, had a very splendid appearance: if trained under a wall or to a trellis, it is also a great ornament. Whether planted in a bed or trained on trellis, it is necessary that the situation be somewhat sheltered from winds, but fully exposed to the influence of the sun.

Cultivated in a green-house, we would recommend it always to be trained to trellis; where, as was the case with some in our houses last year, it will extend from four to six feet square, continue flowering until quite winter, and commence again early in spring.

It thrives in almost any sort of soil, but prefers one that is rich and light. It produces seeds by which it may be increased, but also grows very freely from cuttings, which may be taken off at almost any season, and planted, and otherwise treated, like those of Geraniums.

The generic name is derived from *petum*, a Brazilian name for one of the species.

STREPTANTHERA CUPREA.

(COPPER-COLOURED STREPTANTHERA.)

CLASS. TRIANDRIA.

ORDER. MONOGYNIA.

NATURAL ORDER. IRIDEÆ.

Generic Character.—*Spatha* of 2 valves, membranaceous, somewhat cut, dry. *Perianthemum* like a corolla in 6 divisions; tube very short; limbs regularly wheeled. *Stamina* 3, inserted in the tube; filaments erect; anthers twisted round and including the style. *Stigmata* 3, dilated into 2 fringed lobes. Seeds round.

Specific Character.—Leaves sword-shaped, acute, channelled and cut in the middle. Flower stem bearing from 2 to 4 flowers. *Perianthii* cut ovately obtuse; keel having two spots upon the base.—*Sweet, in Brit. Flower Garden.*

This is a very elegant species, introduced in 1825 by Mr. Synnot, from the Cape of Good Hope. The generic name is derived from *streptos,* twisted, *anthera,* anther, alluding to the twisted form of the anthers; and the specific name is given in consequence of the copper colour of the flowers. All the Cape Irideæ require one general mode of treatment; which, with a few exceptions, may be stated as follows:—

1. Pot the roots, or plant them in a border in front of a stove or green-house, or other sheltered place, during the month of October. Let the soil be composed of equal parts of leaf-mould, sandy loam, and peat, well mixed.

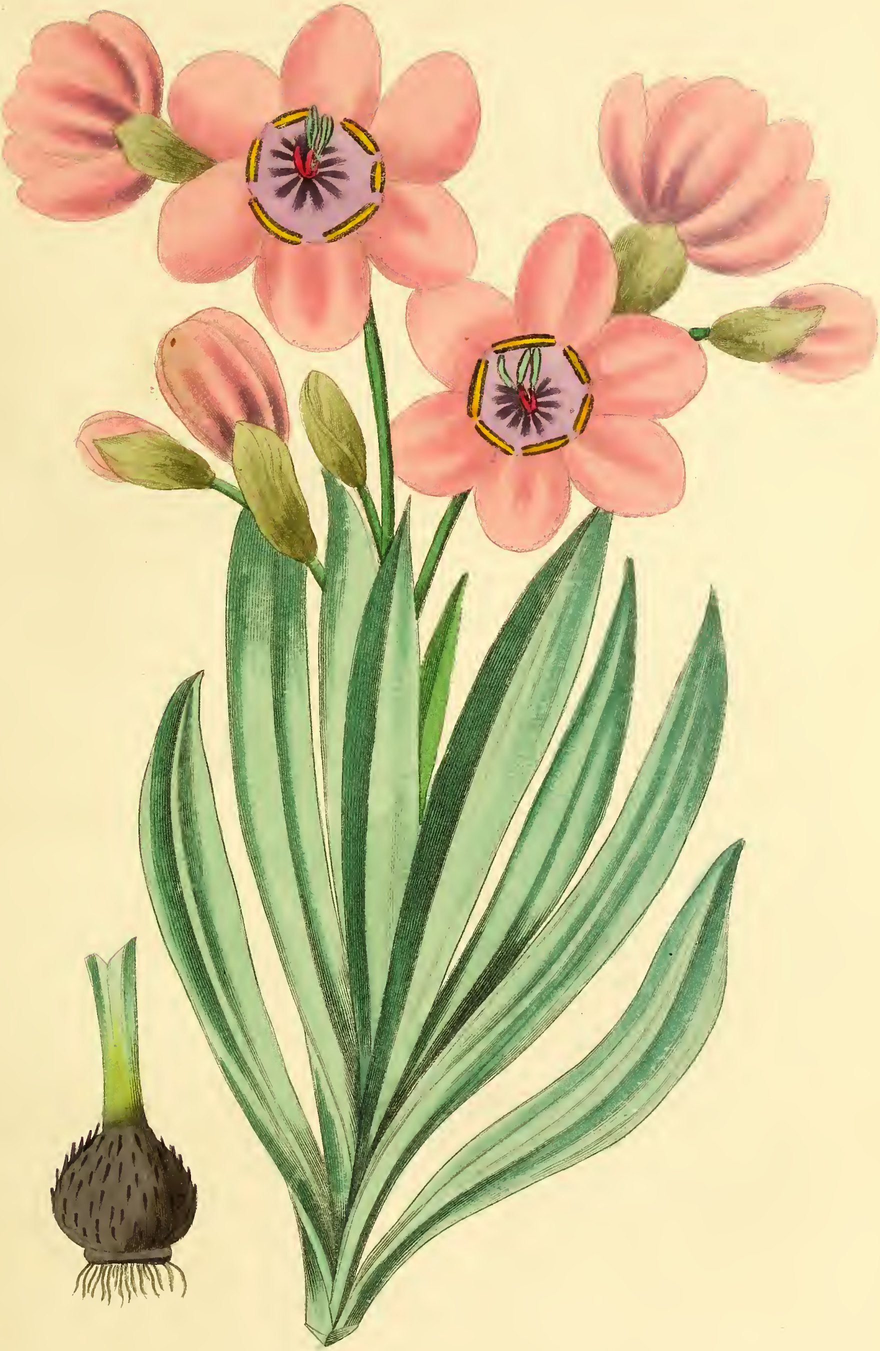
2. If planted in pots, set them in a cold frame, and protect them from severe weather, till the pots are pretty well filled with roots; then remove them to the green-house, or room where they are intended to flower.

3. When potted they must be watered very sparingly, until they have produced leaves and begin to show their flower stems. And after flowering, when the leaves are dead, keep the roots perfectly dry in the pots. If planted in a border or frame, they must be completely preserved from rains, snow, or frost, particularly during their dormant state: in the former case a good thickness of litter will answer the purpose; and in the latter, the frame may be covered with lights.

4. The usual flowering season is April, May, and June, but some species flower somewhat earlier, others later. The plants at that time require to stand in light airy places, and should receive a good supply of water.

5. It is not well to take up the bulbs in less than two or three years, at which times all the offsets should be taken off; but such as are in pots, must be invariably re-potted every October.

No person who cultivates Cape bulbs should be without *Streptanthera cuprea* and *elegans; Sparaxis lineata, grandiflora* and *tricolor; Ixia Heleni, flexuosa,* and *viridiflora; Trichonema rosea,* and some others.



Streptanthera cuprea.

Feb^{y}. 1834.

CULTURE OF THE AURICULA.

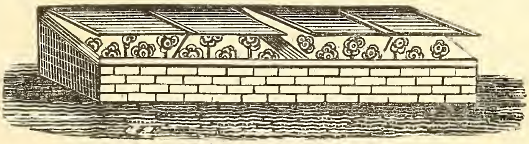
(PRIMULA AURICULA.)

It is evidently as important for a cultivator to know the climate and altitude natural to a plant, as the soil in which it will grow; for if the latter be ever so suitable, and the temperament be not agreeable, the plant will never grow to any degree of perfection. The name Primula is derived from *primus*, first, in allusion to its early flowering, and Auricula, from *auris*, an ear, on account of the leaves resembling the ears of an animal. It is a native of the mountains of Switzerland, Austria, Syria, and the Caucasus.

With regard to the culture, daily observation has convinced us that a plain and simple mode of treatment is the best for all plants, providing they thrive and flower well in the use of it. "Strong stimulative manures, however beneficial they may be for the time, in producing large flowers and vivid colours, too frequently leave the plants in a state of exhaustion, if not of premature and gradual decay *." With this view of the subject we will describe the mode of cultivating auriculas, under fifteen heads:—

1. With regard to a suitable soil, those persons who use only such as is rich, wholesome, porous, and of simple mixture, usually have the best success. Bone dust is an excellent ingredient, and its decomposition being slow, the volatile alkali passes off slowly, which is very advantageous, because the stimulus is of long continuance. Some good new turfy loam, well rotted, mixed with one fourth of vegetable mould, either made from leaves, or gathered from the interior of a hollow tree; one fourth well rotted dung, one eighth river sand, and a portion of bone dust, are all the ingredients necessary to grow them to the greatest perfection. In using bone dust a very small portion of lime will be of great utility mixed with it in the soil, as the animal matter will by this means be decomposed, and immediately fitted for the use of plants. This, must, however, be in a very small proportion, or it will be injurious.

2. All auriculas, to be grown to perfection, must, previous to flowering, stand in an airy, sunny situation; but afterwards, that is, from the end of May to the beginning of September, in one somewhat shaded.



3. From the beginning of September to the end of April, the plants must be sheltered, in a frame or brick pit, sunk or built two feet below the level of the ground; so that when placed upon a platform of boards six inches from the floor, and in flower, they will not reach higher than the surrounding surface. This

---

* Hogg's Supplement on Horticulture.

frame or pit should be covered with wooden shutters, instead of glass lights, to secure the plants from the effects of sudden frosts during the night.

4. Never allow auriculas, either before, at the time of, or after, flowering, to be exposed to heavy dashing rains. When the flower stems begin to rise in February, they may be exposed now and then to a gentle shower, but after the flowers begin to expand, this practice must be discontinued; and be repeated again, but seldom, after they have done flowering until the succeeding February, watered carefully with a small watering-pot, and the leaves kept as dry as possible.

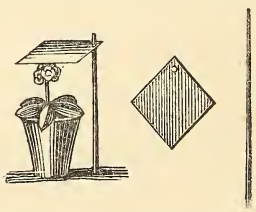
5. Auriculas, while in their winter quarters, must receive as much air and light as the weather will permit. And during the month of March, when the flower stems are rising up, the shutters must be entirely removed in fine days, but replaced again at night; and, in case of frost, be closely covered down with mats or straw. Never expose the plants too hastily to the sun in a morning after frost, but allow every symptom of it to disappear before you open them.

5. During mid-winter, that is, throughout December and January, give auriculas little or no water; but in February and March, water them at least once a week with diluted liquid manure.

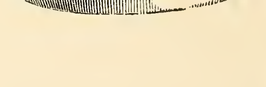
6. Any time from the beginning to the middle of February, the plants must be top-dressed with the soil recommended for potting, taking off a sufficient portion of the old soil, to admit the new. The same process must be performed again in September.

7. When the flower buds begin to swell, thin out all the small ones, never leaving more than ten buds to flower.

8. Although the plants at the time the buds are swelling, must be exposed to gentle rains and the full influence of the sun, the buds themselves must be exposed to neither: the former will cause the colours of the flowers to run into, and mix with, each other; the latter will cause them to be faded and dull. On the other hand, if the buds are never exposed to the sun at all, the colours of the flowers will be much less vivid. To obviate these difficulties, shade the flowers with small boards, about five inches square, placed upon sticks, as in the figure. And to attain brilliancy of colours, expose the buds to the influence of the sun for an hour, or more, every morning, and at all other times: from the buds beginning to swell until they are expanded, and wanted for the show, keep them carefully shaded.

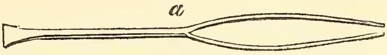


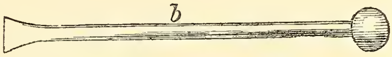
9. Place the plants intended to produce seed under a south wall as soon as the flowers begin to fade, and give them a good supply of water. As soon as the seed is ripe, sow it in pans or feeders, filled with the compost in which the plants are grown, having previously placed a quantity of it in a hot oven, that all the seeds of weeds, &c. may be destroyed. Fill the pans to within half an inch of the top at the edges, but something higher in the middle. Sprinkle the soil with water, sow the seed, and cover it lightly with the same compost, finely sifted.



Place the pans on an eastern or south-eastern aspect; and shelter them from heavy rains, and water lightly as often as they require it.

10. Transplant seedlings as soon as their seed-leaves become pretty strong. Take each up with a small pair of tweezers made of ivory, with very narrow points, so as to raise each by the seed-leaf, and the other end somewhat flat, to loosen them previous to raising (*a*). And likewise a piece of ivory, not more than one-eighth of an inch broad (*b*), to make a small cleft in the soil, to admit the roots of the plant. Transplant as often as the plants require it, placing them in the first instance one inch asunder, and increasing the distance every time, until they are large enough to place in the pots used for flowering.





11. Always pot the plants immediately after the flowering season, that is, about the end of May, or beginning of June, except such as are to produce seed, which must not be potted until the seed is gathered. The proper sized pot for a good flowering plant is ten inches deep, and eight inches wide, at top (inside measure). Good drainage of broken pot is indispensable.

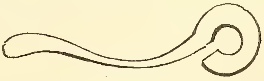
12. In potting never shake off all the soil from the roots, unless the roots be decayed. In taking off the decayed parts, never use a knife to cut them, but always break them off with the hand, for a plant rarely thrives after being so cut.

13. Remove all the large offsets from the plants, some time in March, because they grow the quickest in the spring.

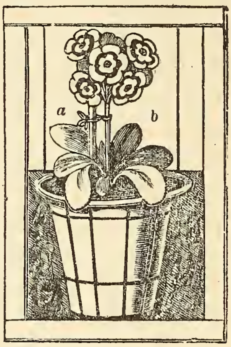
14. Great care is indispensable to secure auriculas from the attack of slugs, particularly in April and May; also it often happens that small caterpillars are secreted in the hearts of the plants; this may be known by the appearance of webs. These depredators must be destroyed, or all cultivation will be useless.

15. All plants, to be healthy, must be kept free from weeds and dead leaves. The former occasion disease, by depriving the plants of nourishment; and the latter, by infection. Great care is requisite never to strip off a leaf, until it is thoroughly dead; for by doing so, a wound is made, which will absorb more water than the plant is able to evaporate. This causes a decay to commence in the wounded part, which soon spreads throughout the whole plant. Whenever this decay is perceived, scratch out the rotted part with the finger, and fill up the place with a little tallow, to keep out the moisture, until the wound heals.

If the flowers when expanded do not lie flat and even, florists use an instrument called a *flattener*, made of ivory: this instrument, if the flower is cupped, is pressed upon the pip until the petals become quite flat. If, on the contrary, the petals bend backward, the flattener is placed under the pip, betwixt the calyx and the corolla, drawing it through the opening, in the eye of the flattener; then each petal is properly straightened by a camel hair pencil.



Many experienced florists place the flowers in perfect darkness for two or three days previous to their being shown, and usually in a cellar, fixing the cut flowers in bottles, and often changing their water. This is found to improve their colours wonderfully. In sending flowers in pots to a distance, a light box should be made to fit the pot; place some moss betwixt the pot and sides of the box, to prevent the pot being broken, bind some upon the top to keep the soil from falling out, and tie the flower to a stick to preserve it from shaking. Then take two pieces of wood (*a b*), just the length of the distance betwixt the pot and the lid, place them upon the edges of the pot close to the side of the box, nail them fast to the lid, after it is placed on the box, and the lid being well fastened down, with common care, no injury whatever can happen to the plant.



NEW AMARYLLIDEÆ.

Amaryllis Kermesina (*Carmine Amaryllis*).—A beautiful plant. The roots were brought from Brazil in the early part of 1833, by Lieutenant Holland, of the Royal Marines, who presented them to Miss Street, of Penryn. The flowers are a rich deep carmine colour. The soil it thrives in is a mixture of loam, peat, and sand. It has hitherto been kept in a warm vinery, and has shown no disposition to increase by offsets.—*Bot. Reg.* Of late years this genus has been greatly increased by a number of hybrids, many of which far surpass the originals, both in the production of their flowers, and the rich variety of their colours: for the most part, they require the temperature of the stove, although *A. pumilio, pudica, blanda*, &c. do very well in the greenhouse, and a few species, as *A. belladonna,* &c. will do in a frame, or even out of doors in warm situations. They are in general easy of culture, and are readily increased by offsets, and many ripen plenty of seeds, if some pollen be shaken on the stigma at the proper time. A shell peeled off the bulb will grow very freely. The strong growing species must be plentifully supplied with water during their time of flowering and growing; they also thrive best if planted in large pots. Mr. Sweet found it an advantage to turn them out of the pots when the bulbs were ripe, and, after shaking all the soil from them, lay them upon a shelf in a dry situation, until they began to show flowers; he then had them potted in a compost of light turfy loam, rather more than one-third of white sand, and turfy peat, well chopped together, but not sifted. But this system of turning them out of the pots will not do for a general rule, as *A. reticulata* and *striatifolia,* or the mules raised from them, will flower much better by remaining in the pots all the year, as do also *A. aulica, calyptrata, solandræflora,* all of which require to be kept dry during their dormant state. *A. regina, crocata, rutila, acuminata, fulgida, Johnsoni, psittacini,* and the mules between them, flower much better if turned out of their pots, and treated after Mr. Sweet's system. Each requires a good drainage.

Pancratium pedale. (*Long-flowered Pancratium.*) One of the most beautiful of the Amaryllis tribe, excelling them all in the extraordinary length of the flowers, which measure a foot from the base of the tube to the tip of the segments. The latter are very narrow and wavy, and of a delicate white. The bulb was sent by Mr. Barnard from near Truxillo, and of course requires the stove.—*Bot. Reg.* All the species of this genus are free flowerers, and the greater part of them inhabitants of our stoves. *P. Canariense* and *Carolinianum,* however, thrive well in the green-house; and *P. maritimum,* and *Illyricum* are perfectly hardy: the *P. rotatum* also is nearly so, requiring only a slight shelter in cold or wet weather. They all flower freely in rich turfy soil, mixed with a small portion of sand and leaf mould, to keep it open. The stove species grow much finer if plunged in a hot-bed until the flowers begin to expand, than they do grown upon the old system of constantly standing in the stove. When the pots become filled with roots, the plants should be shifted into larger; by doing so, the flowering season is greatly prolonged. During their growing, it is necessary to give a good supply of water, but when in a dormant state they should be kept dry, or nearly so. Previous to their beginning to grow again, they should be repotted, removing about three parts of the soil from the old ball: when potted, plunge them in a hot-bed as above directed. They ripen seeds, by which, together with suckers and offsets, they are readily increased.

NEW GESNEREÆ.

Gesnera Suttoni (*Captain Sutton's Gesnera*). We owe the introduction of this fine plant to Captain Sutton, of his Majesty's packet establishment at Falmouth, who informs us that he found it growing in a wood on a sloping hill, near the Bay of Bomviaga, Rio de Janeiro, at an elevation of between thirty and forty feet above the level of the sea, and not exceeding forty yards from the water. Its beautiful bright scarlet flowers attracted his attention, and induced him to dig up the plant and bring it home. It has some resemblance to *Gesnera bulbosa,* but is evidently distinct from that species. It requires the constant heat of the stove, and flourishes in a strong rich soil, and may probably be increased by cuttings. *Bot. Reg.* All the species of Gesnera require the heat of the stove, and should be potted in a light rich soil. Part of them are tuberous rooted, and the others have somewhat of a half-shrubby habit. Most of them will increase by the leaves, although in some cases, as in *G. Douglasi,* &c., it is attended with considerable difficulty. Those with tuberous roots may occasionally be propagated by division of the roots; and the latter, and indeed all, will grow readily from cuttings taken off at the second joint from the top, and planted in sand under a bell-glass, placed upon a warm flue, and shaded after the manner of other tender cuttings with a sheet of thin paper. When they have struck roots, pot them in sixty-sized pots, in a mixture of equal parts of sandy peat, leaf mould, and rotten dung, well chopped together but not by any means sifted. After being potted, plunge them in the bark bed, in a shady part of the stove, until they have begun to grow, when they may receive the full force of the sun. In watering them let the leaves also be slightly sprinkled; but be careful that the water is about the temperature of the house, or the leaves and roots are liable to be injured. If this be attended to they will soon fill their pots with roots. When this is the case, shift them into others, about four inches wide at top, and the same deep.

When they have done flowering, they must receive very little water: this decrease of water, however, should be gradual, so that at the time the leaves are decayed, the soil in the pots should be kept quite dry. After the tops are dead, place them in a cooler situation, where they will receive no moisture, until about the beginning of February, when they should be potted and again plunged in the bark bed, where they will flower beautifully.

COMBRETACEÆ.—Genus Combretum.

Combretum grandiflorum.—(*Large-flowered Combretum.*)— This is one of the many noble plants with which the once-fatal colony of Sierra Leone abounds. It is a scrambling plant, raising itself by means of a very curious kind of hook with which nature has ingeniously supplied it. At first sight, one would wonder what this hook can be; for nothing like spine, or prickle, or tendril, can be discovered upon the branches: for want of these, it is necessary that their place should be supplied by some special provision, which is of the following kind. When the leaves are first fully formed, they are seated upon a foot-stalk of a very common appearance; but, after a time, they fall away, leaving the leaf-stalk behind: the latter does not wither up, but gradually lengthens, hardens, sharpens, and curves, till at last it becomes a powerful hook, admirably adapted for catching hold of the branches of any tree that it may be near, and thus elevating the plant from the earth. These hooks, however, are not to be found on those grown in our stoves, but only in the woods of Sierra Leone, its native habitation.—*Bot. Reg. t.* 1631.

The *C. comosum, purpureum,* and all the other species of this genus, require similar treatment to the *grandiflorum*: they are all very beautiful, particularly the *purpureum,* which makes a most splendid show at the time of flowering. They all thrive well in a mixture of loam and peat: cuttings will root freely if planted in a light soil or sand, and covered with a hand-glass, and placed in the moist heat of a good hot-bed. A good way, also, to obtain fine plants in a short space of time, is to layer some of the branches, which will soon strike root. After they are rooted, pot them off in 60-sized pots, and place them in a shady part of the stove.

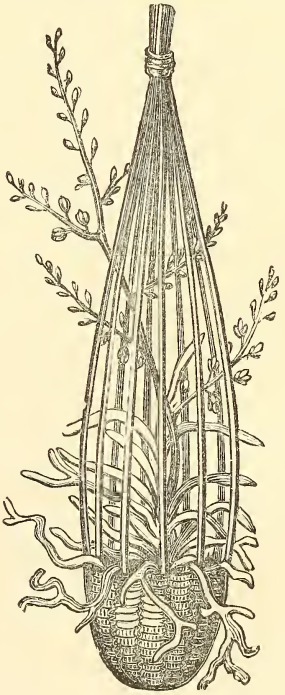
NEW AND BEAUTIFUL ORCHIDEÆ.

Cychnochis Loddigesii is a beautiful and an extraordinary plant. The flowers are large and beautifully spotted with red. It is a native of Surinam, whence it was sent to Messrs. Loddiges, by Mr. Lance, in 1830, in whose stove it flowered in May, and again in the winter of 1832. Dr. Lindley gave it the present name, and published it in his excellent work on the "Genera and Species of

Orchideæ." It requires the stove, and thrives if planted in moss and broken pieces of pot, and is suspended from a rafter.—*Bot. Cab. t.* 2000.

Cirrhæa Warreana.—This is a native of Brazil, and was discovered by Mr. Warre. It bears a strong resemblance to the other species: they are all highly interesting and curious plants, well deserving every possible care in cultivation. It succeeds very well in the stove, planted in moss with potsherds, and a little sandy peat soil. Like the rest, it will admit of occasional increase, by dividing the bulb.—*Lod. Bot. Cab.* The *C. viridipurpurea* should be treated precisely the same as the *Warreana;* but the *C. Loddigesii* will do very well, if potted in a light vegetable mould, providing the drainage be complete. All the species require a very humid atmosphere to bring them to flower in perfection. Indeed, all the *Orchideous Epiphytes* of the stoves require a similar treatment in this particular, although in others they may somewhat differ. The whole genus of *Dendrobiums,* for instance, hang in their native woods upon the trees, in a pendent manner; they, therefore, cannot be cultivated with success, unless some means of this kind are resorted to. The usual mode, therefore, is to suspend the pots in which they are planted to the rafter, or merely hang the plants themselves upon trees, covering the roots with a little moss, so arranged that the branches can shoot freely in their natural way. The *D. secundum, chrysanthemum, cuculatum,* &c., grow very freely, if planted in perfectly rotten wood and moss ; also in pots, covered over the outside with moss. The *D. moniliforme, longicorni, pulchellum,* &c., grow best in moss, mixed with a little vegetable mould and broken pot, and suspended like the other.

The genus Aerides will thrive with a treatment somewhat different to *Dendrobium. A. cornutum* has a most delightful fragrance when in flower, not very dissimilar to that of the tuberose. *A. paniculata* will grow and flower, if cut off from all nourishment except what it receives from the air. It does not, however, flourish so well in this way as if planted in a basket, having a mixture of chopped moss and vegetable mould at the bottom. After the plants are placed in the baskets, spread a little moss over the roots, and hang them up to the rafters, by means of a few twigs, formed as the figure. The Renanthera Coccinea is a splendid plant for this purpose; its beautiful crimson flowers hang in a most graceful manner: but it flowers equally well, if a bit of moss be tied round the stems, and kept constantly damp. After it comes into flower, it may be taken down, and hung up in a warm room of the dwelling house, where, if treated with care, its flowers will continue for a long time. It is readily propagated by cuttings.



PRESERVING CHOICE PLANTS FROM SLUGS.

The season is now fast approaching when slugs and other crawling depredators commence their ravages in our flower gardens, and, unless prevented, may destroy all our choicest productions. Many are the remedies which have been prescribed; but none are so generally applicable as could be desired; although most, under certain circumstances, are found to answer.

Some persons make a few holes about one inch deep round the plants infected, the slugs taking shelter in these holes are easily destroyed by dropping a bit of salt or quicklime upon them. This method, however, will not answer for valuable plants, as the slugs might probably destroy the plants before they sought shelter in the holes.

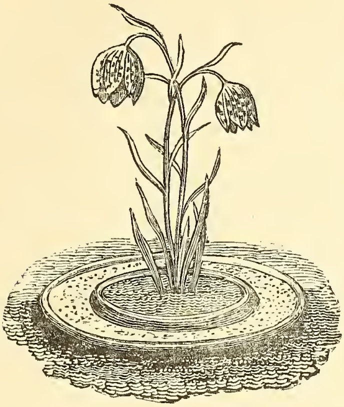
Others water the ground and plants with the drainings of the dunghill, or cow-house, diluted with a little water. Clear lime-water also effectually destroys them. It is made by adding two pecks of quicklime to about sixty gallons of water, and well stirring them together in a large tub, and pouring off the clear liquor into a watering pot, with a rose. If the ground be well saturated with either this or the urine, the slugs will disappear; but the application is fatal to all delicate and tender plants.

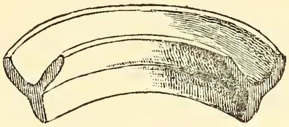
Some spread lime upon the ground, or dig it in, neither of which is of much avail, unless the operation be performed when the slugs are on the surface. Mr. Corbett's system, as noticed in the " Horticultural Register," page 166, is probably one of the best, if not one of the very best, remedies of this kind. " Lightly cover the ground over with good quicklime, at ten o'clock at night, and about three or four o'clock in the morning, in still fine weather, repeat the operation for a few times, and most of, if not all, the slugs, will be destroyed." This, however, can be scarcely considered safe for delicate plants, as an injudicious application will be very likely to destroy them.

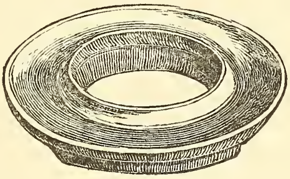
Another method is enticing them by baits: if cabbage leaves are warmed before the fire until they become quite soft, and are then rubbed with fresh butter or dripping, and placed on different parts of the ground infested, they prove an excellent decoy. Also a turnip, cut into halves and hollowed out, and laid on the ground with the hollow part downwards, proves a good place of shelter. Both the leaves and turnips should be examined every morning, and the slugs sheltered under them killed.

Another system is to prevent them from coming near the plants. To accomplish this, many means have been used: dry hulls of oats, saw dust, or sifted coal ashes from an iron foundry, or smithy, strewed upon the ground where the plants are placed, or spread round any particular plant, are impassable barriers, so long as they remain dry; the two latter in particular, because they abound in innumerable sharp points, which no slug can pass over, owing to the extreme delicacy of that part of their bodies upon which they move. But the efficiency of all these is lost after a heavy shower of rain, either from being washed into the soil, or entirely away, as is generally the case with the saw dust and hulls of oats.

To remedy these deficiencies, a circular earthenware pan has been invented to protect single plants, by Miss Bygrave *, an ingenious lady, in the Isle of Wight.

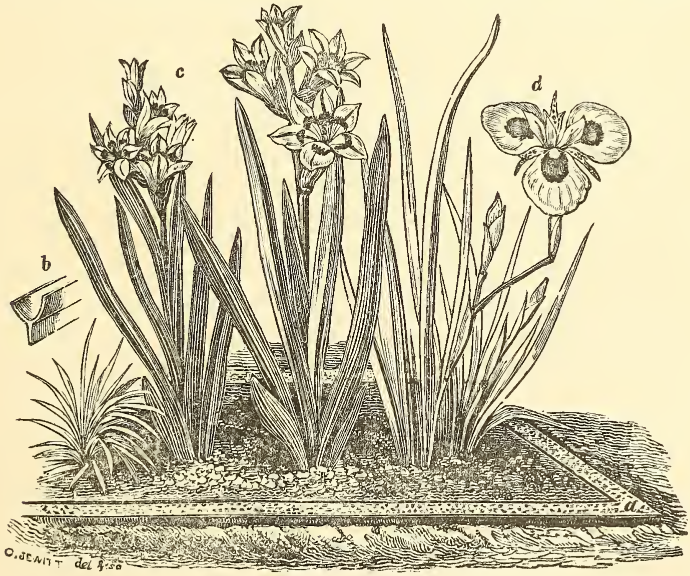






It is placed round the plant nearly even with the surface of the soil, and the hollow part is filled with water, over which the slugs cannot pass. If the plant to be preserved stands in a pot, and the pot be set in a pan or feeder, the "Bygrave Plant Preserver" might be filled with salt, instead of water, which will be much more effectual; but if the pot in which the plant grows be not placed in a feeder, and even then, if the plant be small, there will be great danger of its being destroyed, by a sudden shower of rain washing the salt, either to the roots or leaves.

But if all the choice plants were formed into beds, either by placing the pots



---

* Horticultural Register, vol. i. p. 150.

together, or otherwise, as might be the most convenient, they might very readily be protected with the greatest safety, by another invention of the same lady, called the "Bygrave Slug preventer." It is a leaden gutter, *a, b,* an inch and a quarter broad, having a keel an inch and a half deep, and made in pieces of any desired length, which, when set completely round the hedges of a bed and staunted at the edges with soft solder, or putty, and filled with salt, forms a totally impassable barrier. When the article is used, either slices of turnip, or any other decoy, should be placed here and there on the ground inclosed, for the vermin to harbour under, from whence they ought every morning to be hand-picked and destroyed. Persevering thus for a few days, will completely clear the space within the boundary of salt; and any delicate plants may be placed, or seeds sown, without any danger of being destroyed by this class of depredators.

The plants introduced into the engraving are:—*c,* SPARAXIS LINEATA. A bulbous plant, requiring a pit, or warm border of sandy loam and peat, and to be covered with a mat in case of frost. The flower is white, with a yellow throat, marked with brown; each petal marked with a red line; *d,* VIEUSSEUXIA GLAUCOPIS. This is a native of the Cape of Good Hope, has delicate white flowers, with a bright blue, or rather purple eye, not unlike the spots on the tail of a peacock. It appears to thrive best in a sandy peat earth, and from the changeable climate we experience in this country, it will not prosper without some means of artificial heat, although it does not appear to enjoy the greenhouse; but if planted on a vine border, close under the front wall of a stove, it will generally thrive and flower freely. The only means of propagation is by offsets; the seeds with us very seldom ripening.

ON THE CULTIVATION OF ANNUALS.

ALL Annuals are raised from seeds, and are either *hardy,* and may be sown in the open border; *half-hardy*, requiring to be sown on a hot-bed, and afterwards transplanted; or *tender,* requiring to be kept during the summer in the green-house, or stove. The first thrive well in any common light soil, with little attention, except keeping them free from weeds; the second require rather more care during their early growth, although afterwards they grow well in the same soil as the hardy ones; the third want considerable attention all summer, the soil most suitable for them generally, is about two-thirds of light rich loam, and one-third of rotten dung, or leaf mould.

TREATMENT OF HARDY ANNUALS.—About the end of February, or beginning of March, commence sowing the seeds after the following manner: stir up the soil and make it fine with the hand, if it be light; if not, with a small hand hoe, or fork, then with the finger draw a circular drill, of about six inches in diameter in the circle, and one inch or less deep, according to the size and habit of the plant intended to be sown: cover the seed lightly with moist soil, and place an inverted flower pot over them (if convenient to do so); allow the pot to remain until the seeds have begun to grow, then prop it on one side two or three inches high, until the plants are able to bear the weather; afterwards remove it altogether. Covering the seeds with a pot answers several good purposes: First, it keeps the soil moist until the seeds have vegetated. Second, the sun shining on the pot causes a reflection of considerable heat, and brings up the seeds much sooner than under other circumstances. Third, it screens them from the spring frosts. Fourth, it prevents the soil from being washed off the seeds, or the seeds themselves being washed away by heavy rains; and, Fifth, it preserves them from birds and mice. When the plants are about an inch high, they must be thinned out according to the kind, that those remaining may be able to grow and flower strong: the height the plants grow must also guide the person as to what part of the border they ought to occupy, which (where the selection is choice) may be known by referring to the list annexed. If sown successively through the summer, there will be a constant supply of flowers, till the autumnal frosts kill them. In mild winters they may be kept till towards Christmas, staking, tying, and occasionally stirring the soil; and in dry summers gentle watering in an evening, is then all that is necessary.

Treatment of half-hardy annuals.—These require to be raised in a hot-bed, and when an inch or two high transplanted in pots, and placed where they will receive abundance of air, and be protected from frosts. If a frame could be spared it would be preferable to pots, for transplanting them in; and if the frame be placed upon a declining hot-bed, which would communicate a little heat, it would be very beneficial to them, taking care to give plenty of air and moderate waterings. But if the season is so far advanced that all danger of spring frosts is gone, they may be transplanted where they are intended to flower.

The bed for raising the plants should be about two feet thick in front, and two feet six inches at the back; beat it down pretty level with a fork, but do not trample it, set on the frame, cover it with lights, and allow it to stand three days to settle, then level it properly, and lay on about four inches thick of soil, composed of two-thirds of light sandy loam, and one-third of leaf mould well beaten together, but not sifted; rake the surface smooth and level, and with the hand draw some shallow drills about three inches apart; then thinly scatter the seeds of each sort in the drills, and cover them lightly over with some finely sifted soil, being cautious not to cover them too deep, or they will be liable to perish. Some of the half-hardy sorts will flower early in the spring, if sown in pots the preceding autumn; amongst these may be named the varieties of ten-week stocks, the different species of *Schizanthus, China asters, Tsotoma axillaris,* &c.: the latter should be sown in forty-eight sized pots, in September, or as soon as the seeds are properly ripe. Protect them during winter in a dry frame, and keep them clean and free from dampness; these will come into flower about the end of May. The different species of *Schizanthus* must be treated in a similar manner; these, however, with the exception of *S. pinnatus,* are not very free at producing seeds, unless some pollen be shook on the stigmas when in bloom. Ten-week stocks may be sown at the same time, and treated after the same manner. It is not advisable to transplant any of them at this season of the year: sow but a small quantity in each pot, and when about half an inch high, thin out all the weakest, for it often happens, when transplanted at this time they are never able to make good roots again; and, during the dark months of November and December, are almost sure to perish. When they are grown about two inches high remove a little of the soil from the top, and give them a shallow top-dressing; this will be sufficient until the following March, when they should be shifted into thirty-two sized pots, without disturbing the roots. In May time thin out into the borders, with the balls entire; part, however, may be kept to succeed them in the general sowing in March. The spring sown ten-week stocks are also much forwarded if transplanted in pots, and afterwards turned into the borders. *Calceolarias* do best when transplanted singly into sixty-sized pots, and turned out at the same time as the stocks.

Treatment of tender annuals.—These are sown in pots in February or March, and plunged in a hot-bed. When they are up and have attained one or two proper leaves, they should be pricked out into thimble pots, filled with the compost mentioned in the beginning of this paper; as they advance in growth remove them into larger sized pots until they begin to show blossom, when they may be removed to the houses appointed to receive them. They are divided into two sections, 1st, those which require a powerful heat to make them flower to high perfection, called stove annuals; and, 2nd, such as will flower to perfection with a much less heat, called green-house annuals.

I. Those requiring strong heat.—The Globe Amaranthus (*Gomphrena globosa,*) Cockscomb (*Celosia cristata*), *Centroclinium reflexum, Indigofera endecaphylla, Martinia lutea, Cleome rosea,* &c., &c. The Globe Amaranthus should be transplanted first into thimble pots, and shifted regularly, until finally they are placed in forty-eights, and in these they will flower: the soil most suitable is a mixture of peat, loam, and leaf-mould or rotten dung; they should be allowed to stand near the glass, and be subjected to a moist heat of not less than seventy-five degrees.

Cockscombs may be grown with strong short stems, and very large heads, if they are allowed to remain in small pots until the flowers are formed, then potted in larger pots, and supplied with as much liquid manure, and moist heat, as possible. Sow the seeds in pots, filled with a compost of three quarters leaf-mould, and one quarter sand, and place them in a frame in a good hot-bed. When they are up, and have become large enough to transplant, pot them singly into sixty-sized pots, adding to the above compost a good portion of rich loam; subject them to a very close humid heat, and by no means allow them to stand more than a foot and a half from the glass roof, and occasionally syringe them over head with clear water. When the roots begin to show themselves through the bottoms of the pots, shift the plants into forty-eights, and let them stand in these until they show flowers; then select some of the best shaped, and pot them in thirty-twos, in a compost of one half rich loam, one fourth leaf-mould, and one fourth sand, well mixed and broken together, but not sifted. When the roots have grown considerably, shift the plants into a size larger pots (twenty-fours), in this size they will flower. Give them a strong moist heat, and plentifully supply them from the time they show flower, until they come to perfection, with water, in which dung, of either sheep, fowls, or pigeons, is dissolved.

When the flowers are come to perfection, they may be removed out of the strong heat, and placed with the other green-house annuals, where their colours and beauty will remain throughout the whole summer.

II. Requiring only a moderate heat.—Amongst these, the *Lobelia hypocrateriformis, Manulea argentia, Nierembergia linariæfolia,* &c., require to be potted in sandy peat: the *Salvia foliosa, Browallia grandiflora, Commelina cucullata,* &c., thrive in a mixture of peat, loam, and a small portion of well rotted dung. *Salpiglossis linearis, Loasa volubilis,* &c., do best in a light sandy loam, with a little well rotted dung, without any mixture of peat. Capsicum should be potted in a good rich loam, mixed with about one quarter peat, and one quarter rotten horse dung.

Balsams attain to greatest perfection, if grown by themselves, under the following treatment. When there are plenty of frames, and one can be spared until the end of May, the superior show of flowers, that will be obtained, will probably more than repay for the extra trouble and sacrifice.

As soon as the plants are fit to transplant from the seedling pots, make up a bed of good horse dung, about three feet thick, and after allowing it to settle for a few days, lay about six inches of rotten bark on it. Then transplant the blossoms singly into sixty-sized pots, filled with a mixture of half light sandy loam, one quarter peat, and one quarter of rotten dung. When potted, plunge the pots up to the rim in the bark, and allow a considerable portion of air, by propping up the glasses. Shift them into larger pots as often as they require it, each time diminishing the quantity of peat, and adding more rich loam, so that at the last potting (which must be just after they have shown flower), the compost is nothing more than three quarters of rich strong loam, and one quarter of good rotten dung. Give them occasional waterings with liquid sheep manure, and keep a constant brisk heat to their roots until the time they are removed.

As the season advances, and the plants grow, give a proportionate increase of air, until the beginning of May; the glasses may then be entirely taken off during the day, and nearly put on at night to preserve them from frost. By this mode of treatment, a very great number of blossoms are produced: it will therefore be necessary to thin out the weakest as soon as they are formed. If these rules are attended to, and the sort be good, a most splendid show of large rich coloured double blossoms may be anticipated. We do not wish to convey an idea that balsams will not grow and flower under different treatment. We are satisfied they may be brought to flower very well, with the common treatment of green-house annuals, and perhaps their stems may exceed in size those grown in the manner we have recommended: but the blossoms will be inferior in colour, and in many cases scarcely double, although the sort, under other treatment, might have proved a very excellent one.

SELECTION OF HARDY ANNUALS.

	Feet.	Inches high.
White.		
Omphalodes linifolia (Venus's Navel Wort), growing	0	6
Iberis odorata	0	6
Andosace macrocarpa	9	0
Delphinium Ajacis (Rocket Larkspur)	1	0
Œnothera tetraptera	1	0
Prismatocarpus Speculum Album	1	0
Iberis Lagascana	1	0
Calcnula hybrida	1	0
Purple.		
Valerianella congesta	0	6
Iberis spatulata	0	6
Prismatocarpus speculum	1	0
Eutoca multiflora	1	0
Cleome speciosissima	1	6
Blue.		
Nolana paradoxa	0	6
Lupinus bicolor	0	9
— micranthus	1	6
Convolvulus tricolor	1	6
Yellow.		
Lotus arenarius	0	6
Madia elegans	1	6
Calliopsis bicolor	2	0
— Atkinsoniana	2	0
Helianthus lenticularis	3	0
— petiolaris	3	0
Lupinus luteus	2	0
Rose or Pink.		
Mathiola tricuspidata	0	6
Palavia rhombifolia	1	0
Delphinium Ajacis	1	0
Silene Armeria	1	6
Elsholtzia cristata	1	6
Scarlet and Crimson.		
Saponaria calabrica	0	6
Eucroma coccinea	0	6
Amanthus hypochondriacus	2	6
— caudatus	3	0

N.B. The varieties in the colours of sweet peas, and rocket larkspurs, are so numerous, that they are purchased generally in mixed colours.

HALF-HARDY ANNUALS.

	Feet.	Inches high.
White.		
Argemone grandiflora	1	6
Nicotiana multivalvis	2	0
Petunia nyctaginiflora	2	0
Purple.		
Gentiana humulis	0	4
Clarkia Pulchella	1	6
Œnothera Romanzovii	1	6
Convolvulus Major (creeper)	10	0
Yellow.		
Calceolaria pinnata	2	0
Anthemis Arabica	1	6
Zinnia multiflora flava	1	6
Blue.		
Clintonia elegans	0	6
Isotoma axillaris	1	0
Callistema Indica	1	0
Trachymene cœrulea	2	0
Ipomœa hederacea (creeper)	10	0
Scarlet and Crimson.		
Zinnia violacea coccinea	2	0
— multiflora rubra	2	0
Eccremocarpus scaber (creeper)	10	0
Variegated Flowers.		
Schizanthus retusus	1	6
— Hookeri	1	6
— pinnatus humulis	1	0
* — pinnatus	2	0
* — Priestii	1	0
* — Grahami	2	0
* — porrigens	2	0
Salpiglossis picta	1	6
— atropurpurea	1	6

China and German asters; Russian, ten-week, and German stocks, are not enumerated in the above, in consequence of the very numerous varieties. Seeds of each variety may usually be obtained in the seed shops, mixed together in one paper.

TENDER ANNUALS.

White.		
Gomphrena globosa alba	1	0
Nierembergia lineariæfolia	0	6
Blue.		
Salvia foliosa	1	6
Browallia grandiflora	2	0
Commelina cucullata	1	0
Purple.		
Gomphrena globosa	1	6
Lobelia hypocrateriformis	1	0
Rose or Pink.		
Cleome rosea	1	6
Centroclinium reflexum	2	0
Yellow.		
Salpiglossis linearis	1	0
Martynia lutea	1	6
Loasa volubilis	1	6
— hispida	2	0
Manulea argentea	1	6
Scarlet.		
*Indigofera endecaphylla	1	0
Variegated.		
*Gomphrena globosa striata	1	0

The varieties of the balsam, cockscomb, and capsicum, are very numerous, and are generally to be purchased with the different colours mixed.

OPERATIONS IN FEBRUARY.

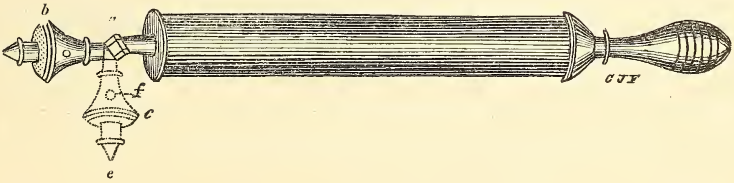
Annuals (Tender) may be sown about the end, in pots filled with a mixture of two-thirds light rich loam and one-third leaf mould. Cover the seeds very lightly, and plunge the pots into a hot-bed. In watering, either do it with a very fine rose watering pot, or with a syringe.

Auriculas about the middle of the month should be top-dressed with a mixture of one-half good new turfy loam; one fourth vegetable mould, either made from leaves or gathered from the interior of a hollow tree; one-fourth well rotted horse dung; a portion of river sand, to keep it open; and a handful or two of bone dust. Take off about two inches of the soil from the top previous to adding the new Begin also to water with liquid manure about once or twice a week.

Dahlias. A few of the old roots should be now plunged in tan, to excite them to grow. The seeds should also be sown in pans or feeders, and placed in a hot-bed till up.

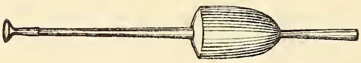
Polyanthuses should be top-dressed in the same manner as Auriculas; but the soil need not be so rich. Also sow the seed in the same manner.

Pinks, Carnations, and Hyacinths, if taken into the forcing houses, will come early into flower. All plants of this kind, as well as roses, lilacs, &c. &c., will, during forcing, require a little water sprinkling over their leaves about three times a week. This is best done by means of a syringe; and none, perhaps, will answer the purpose better than Siebe's.



It consists of only one apparatus, which can instantly, by turning a pin, be applied so as to serve the purpose of four different caps. By means of an universal joint (*a*) the cap or head (*b*) may be turned in any direction and to any angle (*c*). The pin, by which the alterations in the rose head are effected, works in a groove (*d*) in the face of the rose; and by it a very fine shower, a coarse shower, or a single jet, from one opening (*e*) may be effected at pleasure. The valve (*f*), by which the water is admitted to the syringe, is in the side of the rose. Reid's is also a very excellent syringe; but if the cultivator possesses neither, a watering pot with a very fine rose may be used for the purpose.

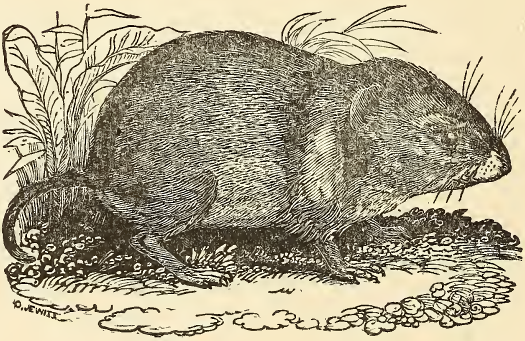
Rose Trees in pots, now brought into the forcing house, will flower about the beginning of May. These plants, when forced, are very often much troubled with the *aphis*. If only one or two plants are infested, a sprinkling of tobacco water with a syringe will destroy them ; but if the insects have spread through the whole house, it is better to fumigate. This may be either done with a detached fumigator. fitted on a common pair of bellows, or merely with a pair of bellows and a flower pot, to contain fire and tobacco, with a hole in the side, at which to use the bellows.



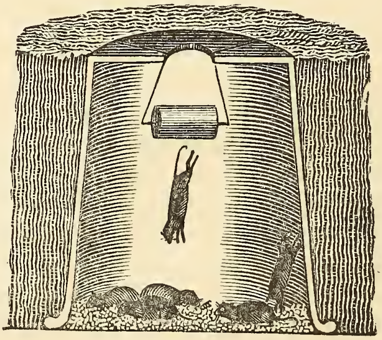
Schizanthus retusus, and other species, should be sown about the middle of the month.

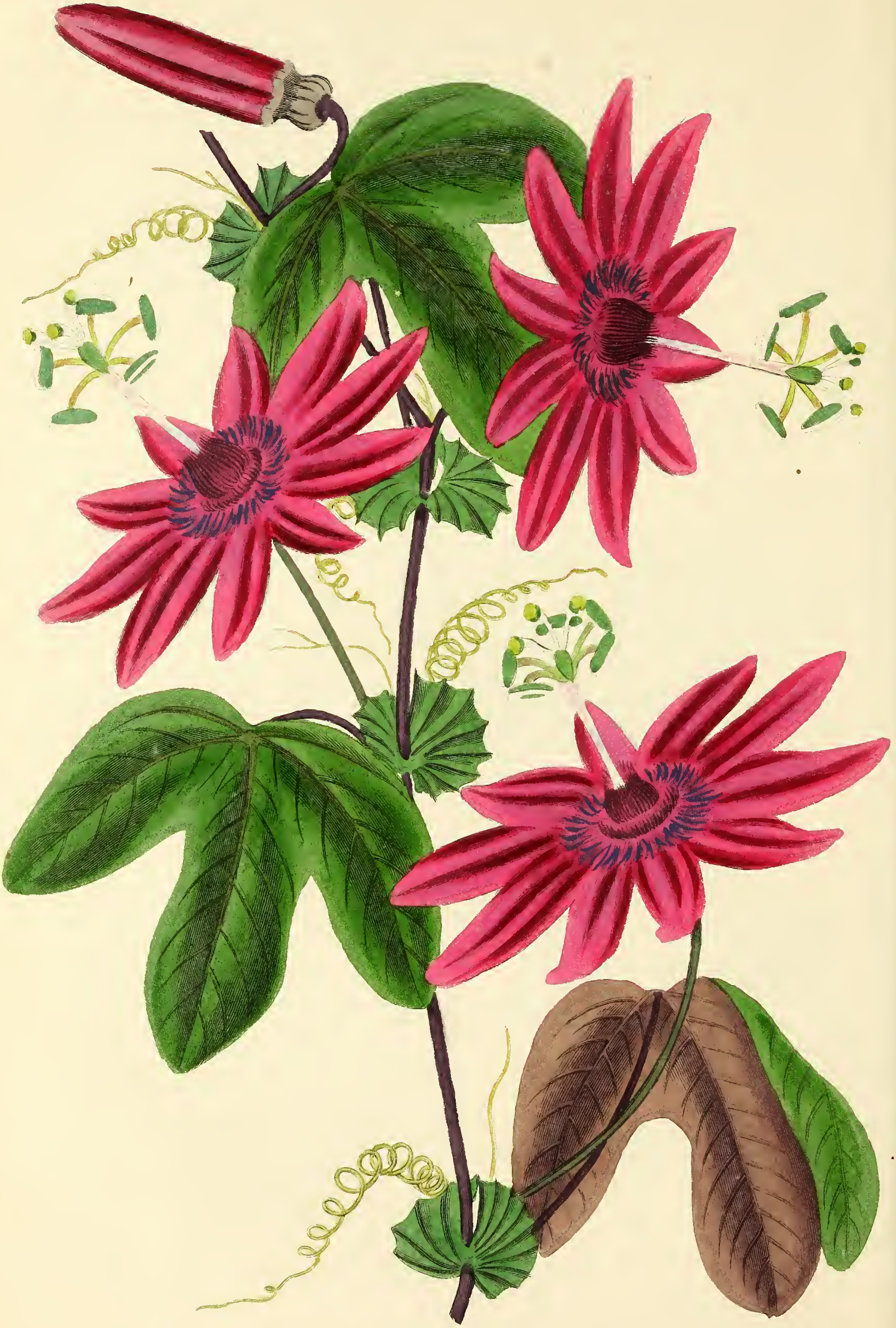
Tuberoses, about the end, should be planted in small pots filled with rich loam, placing a root shallow in each pot ; and then plunging the pots in a hot-bed or pine pit.

TO DESTROY MICE IN THE FLOWER GARDEN.



During February, Mice are often very troublesome in the flower garden, particularly the short-tailed field-mouse (*Mus arvalis*), which devours many of the bulbous roots. Perhaps no trap is more efficacious and simple than one invented by Mr. Howden, gardener at Heath House, Staffordshire. It merely consists of a large flower-pot, inverted on a board or slate, and sunk in the ground nearly level with the surface. Opposite to the hole in the bottom of the pot, and about two inches from the surface or entrance, is suspended on a crooked piece of wire a smooth wooden roller, like the casto of a bed-post; this the mouse will leap upon, and from thence be precipitated to the bottom, from whence it can never escape. The surface may be sprinkled with chaff or short straw, and a mixture of grass and clover seeds about the hole. The roller may be besmeared with lard, and dusted over with flour or oatmeal. In wet weather a rough tile may be set over the hole to keep it dry.





Paſsiflora Kermesina.

PASSIFLORA KERMESINA.

CRIMSON PASSION FLOWER.

CLASS. MONADELPHIA.

ORDER. PENTANDRIA.

NATURAL ORDER. PASSIFLOREÆ.

Generic Character.—*Calyx* inferior, in 5 divisions, coloured. *Corolla* 5 petals, inserted in the calyx. *Nectarium*, a crown. *Fruit*, a fleshy, smooth, berry, rarely hairy, containing many seeds.

Specific Character.—The whole plant smooth; leaves heart-shaped, cut into three lobes, slightly toothed, leaf stalks, each having two glandular hairs; flower-stalks solitary, much longer than those of the leaves; calyx and corolla carmine colour; corona or crown purple;—a very *beautiful slender* climber.

In speaking of this splendid species, we cannot do better than give the words of Professor Lindley:—“This is beyond all comparison the most beautiful species in cultivation, except *racemosa*. Its flowers have a richness of colour which art cannot imitate; they are produced in very great abundance at almost all seasons; and in consequence of the length of the slender stalks from which they singly hang, the whole plant has a graceful aspect, which is unrivalled even among passion-flowers.” It was introduced to the Horticultural Society garden in 1831, from Berlin.

It thrives well with us at Chatsworth, potted in a mixture of loam and peat, and placed in the orchidea stove, where it obtains plenty of heat and moisture.

If cuttings be made of the firmest of the previous season's wood, in May, and they be planted in pots well drained with potshards, and filled up with sand; and afterwards placed in a temperature of from 70 to 80 deg. Fahr., drying them occasionally to prevent their damping off, but little difficulty will be found in striking them. These will make fine plants by autumn.

The greater part of this genus require the heat of the stove; the *P. quadrangularis*, in particular, seldom does well except it be grown in the corner or side of a bark bed. Either, therefore, make a square partition with bricks or boards one foot wide, and two feet deep, or make a box for the purpose, and plunge it on one side of the tan pit; leave in this box or division several holes round the sides, for the egress of the roots, fill the box with good rich loam, and place in the plant. Every autumn shorten the stems of the plant in a similar manner to cutting a vine: that is, if the young shoots are found weak, shorten them to two or three eyes off the old wood, and the stronger ones proportionally. In February, just before it starts growing again, raise it, if convenient, out of the box, and trim its roots, and after having put in a supply of new soil, replace it; if not convenient to raise it, take out as much of the old soil as can be got round the sides of the box, reduce the ball about one third, and add a fresh supply of loam. Abundance of water is also requisite during the flowering season, or the fruit will set very shy, even with impregnation. Fruit are produced from the end of June till Christmas. This, in connexion with *edulis*, *alata*, *ligularis*, *incarnata*, *maliformis*, and *lancifolia*, are grown for their fruit in America, where they are known by the name of Granadillas, because the fruit bears a resemblance to the Granada, or Pomegranate.

Passifloras are sometimes rather shy at setting their fruit; this may be remedied by impregnating with the pollen of other species in preference to their own pollen.

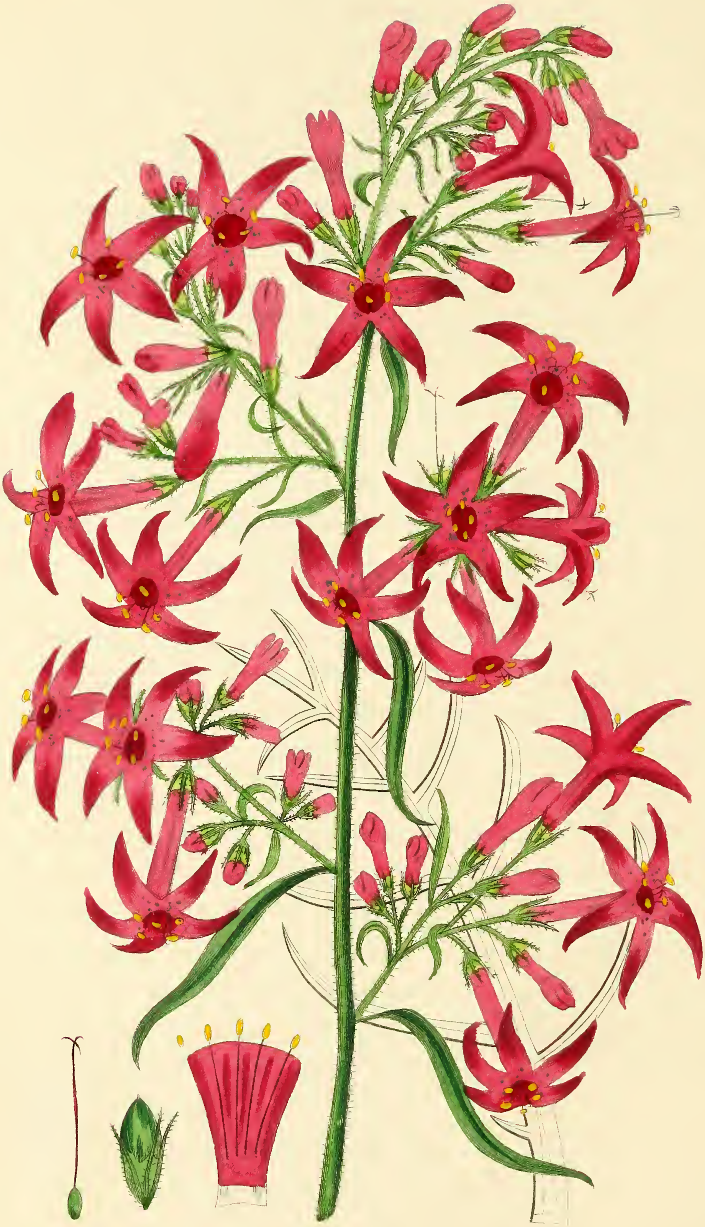
The *quadrangularis* is much cultivated in the West Indies as an ornamental climber, especially for arbours and covered walks. The fruit is somewhat watery, rather fragrant, with a grateful taste, betwixt sweet and acid: the bloom is very large and handsome. It is frequently grafted upon the *cærulea* in France, where it flowers and fruits the same season it is grafted, sometimes when not above two feet high.

The *alata* will grow under the floor of a hot-house, and in other situations where most of the stove species will not live; only it is necessary to keep the roots quite moist. The *racemosa* will bear fruit if impregnated with the pollen of *alata*, or other species, but shows no disposition to do so when confined to its own stamens.

The *maliformis* is plentiful in the woods of Jamaica, where its fruit forms a principal part of the food of wild swine. The hard shell-like rind is manufactured into snuff-boxes and toys of various kinds.

The *vespertilio* is remarkable for its hours of flowering, being from 10 o'clock at night till towards 7 or 8 o'clock the next morning. The *fœtida* is called in the West Indies, "Love in a Mist," because its unexpanded flowers are curiously enclosed in a feathered involucre. Of *rubra* an intoxicating drink is made, which is said to be a safe narcotic.

All the stove species require cutting in more or less every autumn.



Ipomopsis Elegans

MARCH 1834

IPOMOPSIS ELEGANS.

(ELEGANT IPOMOPSIS.)

CLASS. PENTANDRIA.

ORDER. MONOGYNIA.

NATURAL ORDER. POLEMONIACÆ.

GENERIC CHARACTER.—*Calyx* in 5 divisions, tubulous and membranaceous. *Corolla* funnel-shaped, much longer than the calyx, coloured, deciduous. *Stamina* 5, inserted within the tube of the corolla. *Capsule* 3-celled, and many seeded. *Seeds* angular.

SPECIFIC CHARACTER.—Stem erect, the top somewhat pendulous, clothed with abundance of soft hairs. Leaves deeply pinnatifid, and spear-shaped. Flowers growing in clustered panicles. *Corolla* funnel-shaped, carmine colour, tube narrow, limb 5-cleft. Segments terminating in a sharp point, marked round the mouth of the tube with irregular white spots.

SYNONYMS.—Gilia aggregata, *Sw. Br. Fl. Gard.*, fol. 218. G. pulchella, *Douglas.* Cantau aggregata, *Pursh.*

THIS beautiful plant is a native of the North-west coast of America, whence it was introduced to the garden of the Horticultural Society, by Mr. Douglas in 1827.

Whether it is naturally a perennial or not is uncertain ; it seldom with us survives two years, being very impatient of cultivation. We have seen individual plants of it thrive and flower beautifully, whilst their neighbours of the same sowing, and apparently experiencing the same treatment, have fallen over just above the ground when about to flower, without any apparent cause.

Not being able to define the cause, we therefore remain incapable of prescribing a certain remedy for this sudden loss. We shall merely state that we have succeeded very well by sowing the seeds in the autumn, thus allowing the young plants sufficient time to get strong before they show a tendency to flower, for if they show flower whilst the plants are weakly they are almost sure to perish.

They seem to be impatient of glaring sunshine, to obviate which, we have planted them upon a north border in peat earth, but they did not thrive well in that situation and soil. This might have been occasioned in part by the wetness of the season, but we apprehend not altogether, as Mr. Lindley states in the Botanical Register, folio 1281, that " The plant will not live in either peat or light soil."

The best method we know of is to plant them in a cold, damp soil, under either an eastern or western wall, where they will at least be shaded more than half the day.

There is scarcely any plant appears more beautiful or graceful when flowering in the green-house, or conservatory, than this does. For this purpose we would recommend them to be grown in a cool, airy frame; they do not like to be often disturbed at the roots, so when the plants have become pretty strong, place them at once in the pots intended for flowering. The sized pots for this purpose are about ten inches wide at top, and twelve inches deep; fill these with a free loamy soil, and allow each plant to stand high in the centre of the pot, as recommended for the *Schizanthus*, page 6. With this treatment they will produce seeds, by which they are increased.

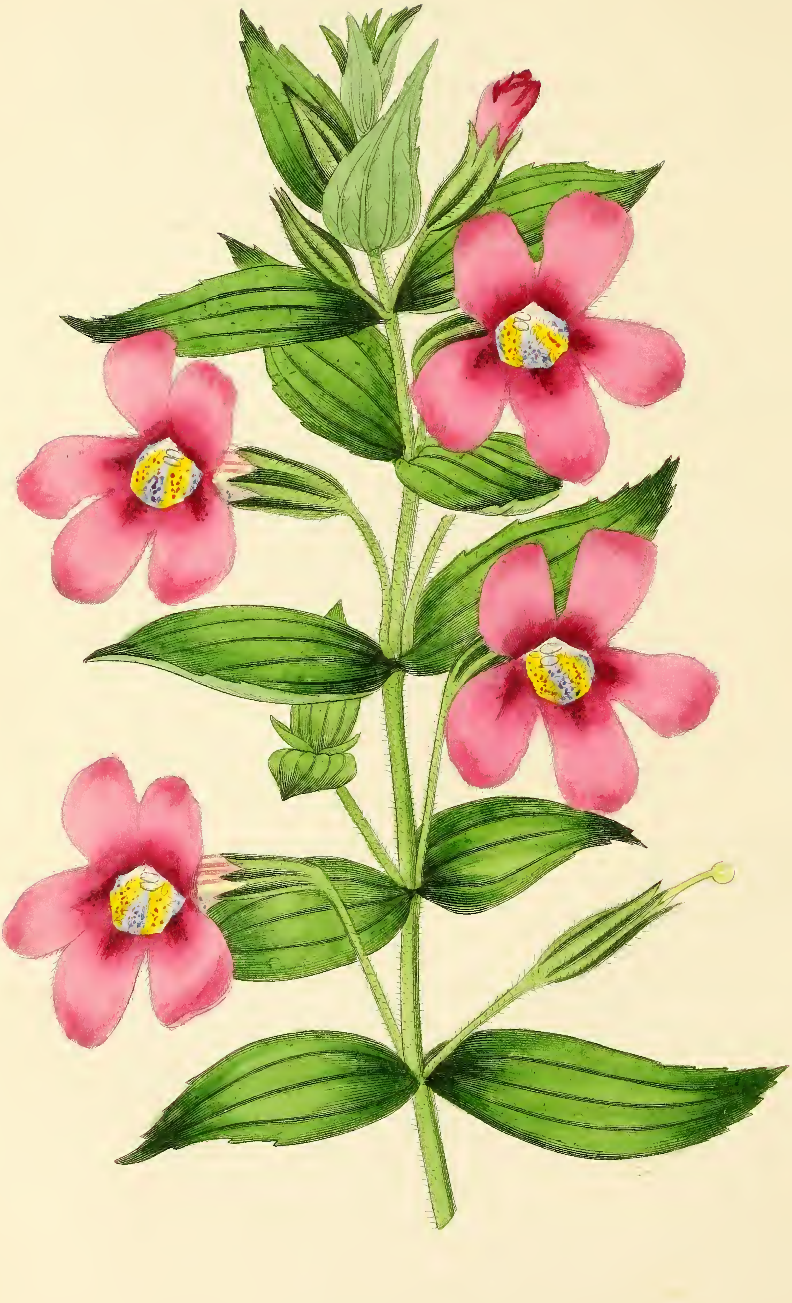
The present subject grew and flowered on a south border of sandy loam, but it suddenly disappeared, without our being able to trace the reason. Our figure differs materially from Mr. Lindley's, in the colour of its flowers and narrower segments, and from Mr. Don's, in its drooping head, less brilliancy of colour and size of the leaf; we regret however that any proximity appears in the form of the panicles of flowers, which we wish at all times to scrupulously avoid.

The *genera Ipomopsis* and *Gilia* bear a very close affinity with each other, particularly in the present subject and the *G. coronopifolia;* but the former is covered with more downiness than the latter, and in the latter the segments of the *corolla* are somewhat narrower. There are, however, some doubts entertained relative to the propriety of separating it from *Gilia*, and therefore Mr. D. Don has given it the name of *Gilia aggregata*, in Sweet's British Flower Garden, t. 218, N. S.

The generic name is derived from *Ipo*, to strike forcibly, and *opsis*, sight, alluding to the dazzling appearance of the flowers; and the specific name *elegans*, from the elegant and graceful manner of its growth.

The annual species of *Gilia* may be sown in the open border, and require the common care of other hardy annuals; and the biennial species should be raised on a hot-bed or in the stove, and when potted off, they should be kept amongst the green-house plants.

All green-house biennials may receive the same treatment as tender annuals, and although they generally terminate their lives at the end of the second year when allowed to flower and seed, yet most, if not all of them, will live for three or even four years if the flowers be nipped off as soon as they appear, and the plants be preserved from injury.



Mimulus roseus.

MIMULUS ROSEUS.

(ROSY MONKEY-FLOWER.)

CLASS. DIDYNAMIA. ORDER. ANGIOSPERMIA.

NATURAL ORDER. SCROPHULARINEÆ.

GENERIC CHARCTER.—*Calyx* 5-toothed, with elevated angles, *Corolla* personate, upper lip two-lobed, the lower one parted into three segments. *Stamina* didynamous. *Anthers* divaricated, spreading lobes. *Stigma* composed of two plates. *Capsule* inclosed, two-celled, two-valved, valves entire.

SPECIFIC CHARACTER.—The whole herb covered with soft glandular hairs. Leaves ovate-oblong, acute, occasionally furnished with a few minute teeth. *Calyx*, teeth nearly equal and sharp pointed. *Corolla* twice as long as the calyx. Stamens shorter than the tube.

THIS is a very beautiful species; indeed, with the exception of the two varieties of *rivularis*, viz. *Smithii* and *Youngii*, it may be stated as the handsomest *mimulus* cultivated. Mr. Douglas sent seeds of it, in 1831, from North California, to the Horticultural Society of London, in whose garden it flowered the following summer, and was figured by Dr. Lindley in his excellent Botanical Register, fol. 1591.

It is a perennial, and seems scarcely so easy of culture as the generality of this genus. The best way is to keep it constantly either in a frame or green-house, potted in light loam, and the pot placed in a pan of water. It will, however, grow and flower in the open borders during summer, but in this case its flowers are very small, and very little ornament, and it is indispensable to shelter it in winter either in a green-house or frame. It is increased by cuttings, and occasionally it ripens seeds. A strong musky odour is emitted by it, similar to that of the *moschatus*.

All the species of *mimulus* are remarkable for the irritability of the stigma; the two lobes lie rather wide of each other when not irritated; but if touched slightly with a needle, a straw, or a bristle, they instantly close.

The annual species, as *floribundus* and *parviflorus*, are raised easily from seeds, which may be sown in April, in a warm situation in the open border in common soil; they, however, grow stronger if the soil be peat. As soon as they are large enough, thin them carefully out, or they are liable to damp off.

The hardy perennial species and varieties, as the *moschatus*, *luteus*, *luteus rivularis*, *alatus*, &c., are easily increased by divisions of the roots and seeds. The *moschatus* thrives much the best if planted in a shady damp border of peat soil: in such a situation the leaves and flowers will grow remarkably strong; but it will grow in almost any soil or situation, and gives out a powerful musky odour. The *luteus*, and the variety *rivularis*, spread rapidly if planted by the side of a pond of water, particularly the latter; they both succeed admirably in pots kept standing in water. With this treatment the leaves and stems of the *rivularis* assume a brown colour, and the rich brown spot is very conspicuous. Both the *luteus* and *rivularis* seed freely; if the seeds be sown in spring, the plants will flower in the autumn, and if in autumn, they will flower the following summer. If placed in a hot-house, its colours are paler, and less beautiful, although the plant itself grows taller than under any other treatment.

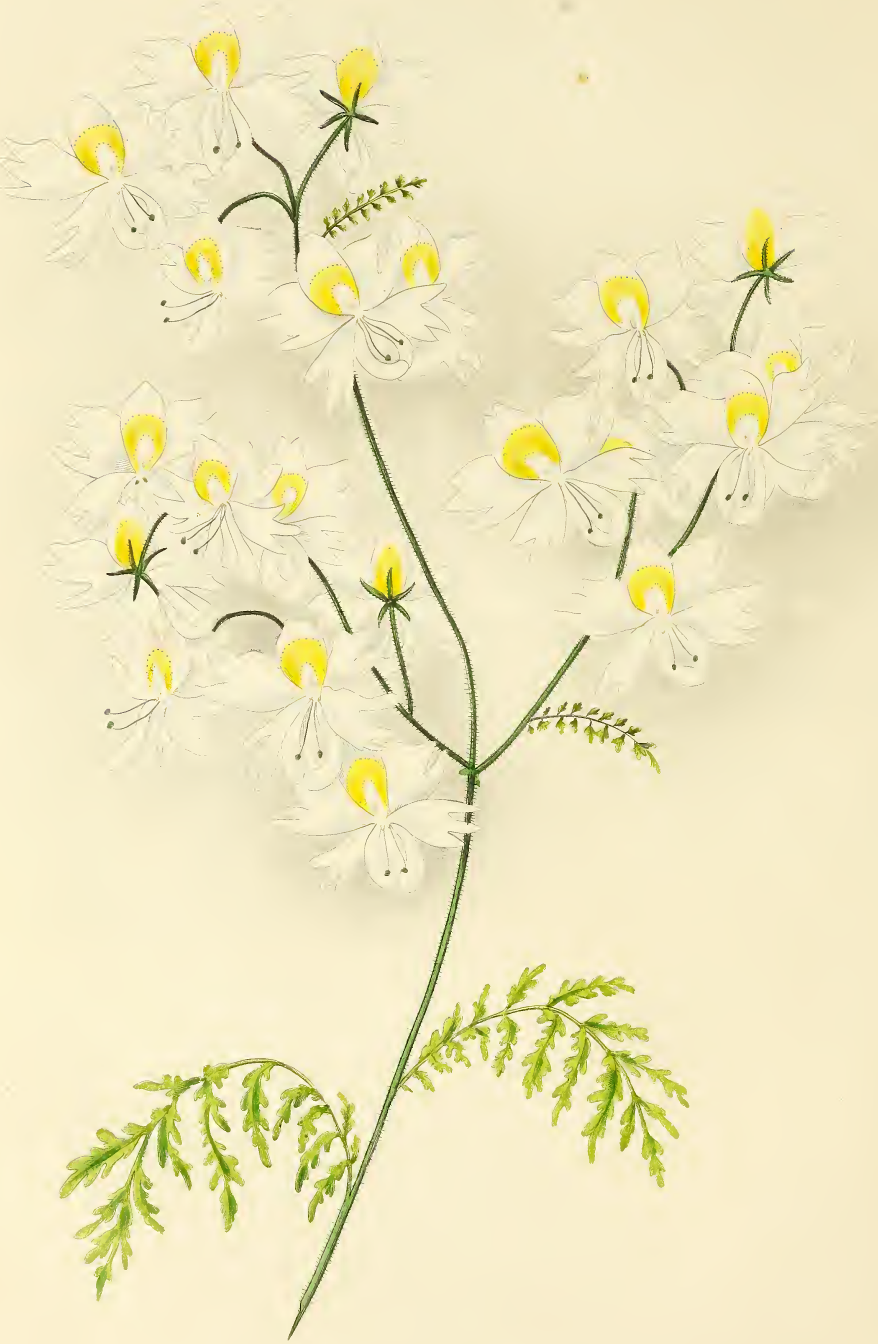
Those requiring the shelter of a frame in winter, as the *guttatus* and *lanatus*, require similar treatment to the green-house species.

The greenhouse species and varieties, as the *glutinosus*, which is now nearly lost in our greenhouses, the *variegatus*, *Smithii*, *Youngii*, will do in almost any rich, light, and porous soil; but the pots in which they are planted should be placed in pans filled with water.

That beautiful variety, *Smithii*, is just coming into flower at Chatsworth; we propose shortly to give a figure of it and the *variegatus* on one plate.

We raised a very beautiful variety from seed bearing some resemblance to *Smithii*, but with a marked difference in its spotting, which we may probably find occasion to figure shortly.

The word *Mimulus* is derived from *mimo*, an ape; whether this idea of an ape or monkey was suggested by the shape of the flower or the appearance of the seed, is uncertain; probably it was the former; *roseus* originates in the colour of the flowers being rosy or pink.



Schizanthus Priestii.

SCHIZANTHUS PRIESTII.

(PRIEST'S WHITE FLOWERING SCHIZANTHUS.)

CLASS. DIANDRIA. ORDER. MONOGYNIA.

NATURAL ORDER. SCROPHULARINEÆ.

GENERIC CHARACTER.—See page 5.

SPECIFIC CHARACTER.—Whole herb slender and graceful, 2½ feet high, springing from a single bottom stem, and producing from 20 to 24 branches or side-stems, each containing from twenty to thirty flowers. Stems covered with glandular hairs, and are distinguished by their whitish hue. Leaves smooth, pinnatifid, of a light and beautiful green. *Corolla* wholly white, except a beautiful yellow spot at the base of the upper segment of each.

THIS beautiful variety was raised from seed by Mr. Myles Priest, nurseryman, &c., of Reading, Berkshire, who furnished us, some little time back, with the present figure and description; it has much of the graceful character of, and corresponding generally with, the *S. pinnatus*, of which species it may possibly be a variety. Mr. Priest says it has upwards of 600 flowers open at one time, and that it continues flowering for upwards of five months. It has indeed a very beautiful appearance, and cannot fail to be admired. The drawing was taken in June, when the plant had been in flower nearly six weeks. There seems little doubt, from the accounts of those who have seen it, but that it is an entirely new and distinct variety. Mr. Priest has given it the same kind of treatment as the *S. retusus*, (see page 5,) and has a number of fine young plants which partake of the same nature as their parent, being quite distinguishable from *S. pinnatus*.

The extraordinary irritability of certain plants forms a very striking feature in the vegetable world; and the peculiarity of shape in others so nearly approaches the lowest link in the animal world, that it is not easy to define the difference between the one and the other. If, as is supposed, plants be really endued with sensation, and possess a nervous system, this difficulty is greatly augmented; and the existence of either sensation or instinct, or of something very analogous, seems to have been partially proved. Vegetable poisons, such as belladonna, nux vomica, &c., which destroy animal life by acting only on the nervous system, cause the leaves, when applied to plants, to shrink or curl up, which, after appearing considerably agitated, become flaccid, and the plant dies in a few hours. The sensitive plant and some others close their leaves, and shrink back on the slightest touch, as if they apprehended danger. If two or three drops of prussic acid be poured upon the plant, the leaflets close, become agitated, flag, and do not regain their usual habit for upwards of eight hours.

These poisons are known to be incapable of injuring the animal frame, except through the medium of the nerves; and this fact favours the supposition that certain organs exist in plants which are analogous to the nervous system in animals, and on which these poisons act. Indeed Dutrochet has observed in the walls of the cellular and fibrous tissue, small semi-transparent globular and linear bodies, which he considers to be the elements of a diffused nervous system, and he ascribes the movements of plants to their action.

M. Marcet, of Geneva, after trying a series of experiments with mineral and vegetable poisons, concludes,—

1st. That metallic poisons act upon vegetables nearly as they do upon animals; they appear to be absorbed and carried into the different parts of a plant, altering and destroying the vessels by corrosive powers.

2ndly. That vegetable poisons, especially those which have been proved to destroy animals by their action upon the nervous system, also cause the death of plants; whence he infers that there exists in the latter a system of organs which is affected by poisons nearly as the nervous system of animals.

These discoveries neutralise many, if not all, of the former definitions of plants. One of the ancient botanists defined a plant to be an animal fixed by means of a root. Jungius, who lived about the beginning of the seventeenth century, defined a plant to be a body possessing vitality, but without sensation, and fixed to a certain spot, from which it derived the nourishment necessary to the development of its parts and the re-production of its species. Linnæus, in fixing the boundaries of the mineral, vegetable, and animal kingdoms, said, "stones grow; plants grow and live; animals grow, live, and feel." M. Bonnet, of Geneva, defined a plant to be an organised body, nourished by means of roots placed *externally*, an animal being an organised body nourished by means of roots (lacteals) placed internally. Hedwig considered that the re-productive organs of a plant, after having discharged their peculiar functions, uniformly decay and drop off, before the fruit has reached maturity, while those of the animal remain permanent, and perish only with the individual itself. M. Mirbel has latterly introduced a criterion, founded on the character of the substances on which plants and animals feed. Plants feed upon unorganised substances, as earths, salts, water, or gases. Animals feed upon substances already organised, as vegetables, animals, or their products: but never wholly upon substances in an unorganised state. From this last definition, Mr. Keith deduces that a vegetable is an organised, and living substance, springing from a seed or gem, which it again produces, and effecting the development of its parts by means of the intro-susception and assimilation of unorganised substances, which it derives from the atmosphere or from the soil in which it grows. An animal is an organised and living being, proceeding from an egg or embryo, which it again produces, and effecting the development of its parts by means of the intro-susception of organised substances, or their products.

Irritability in some cases resides in the leaves, as in *Dionæa*, &c. and at other times in the flowers, as in the *Schizanthus*, *Berberis*, *Opuntia Tuna*, *Aristolochia Clematitis*, *&c.* in all which the stamina are so irritable, that if touched in certain parts they instantly start from their former positions, and striking their heads against the stigma, answer the end for which they were designed.

CULTURE OF THE CAMELLIA.

The Camellia has been in this country nearly a century, being introduced from China in 1739; and, although it is justly esteemed as one of the most beautiful plants in cultivation, the means necessary to be used, in order that it may flower to perfection, are so very little known, that we feel a pleasure in being able to lay down a few definite rules, from our own observation.

1. *Potting.* Always perform the operation of potting immediately after the plants have done flowering, which will be about the end of March.

2. At the time of potting never use a knife to trim off the roots; if they are matted, merely break off the matted parts with the hand, disturbing the ball as little as possible. If not matted, place them carefully in another pot of new soil, without disturbing the roots at all.

3. Good drainage is indispensable; no plant will thrive long unless this be attended to. This may be obtained by laying plenty of broken crocks, or cinders, at the bottom of each pot, previous to putting in the soil.

4. The soil in which they appear to grow and flower with the greatest freedom is composed of the following ingredients:—To one barrowful of rich hazel loam, add one-third of a barrowful of fine sand, half a barrowful of peat, and half a barrowful of leaf mould or very rotten dung. Never at any time, even for small plants, sift the soil, but chop and mix it well with a spade till it is broken fine.

5. *Temperature.* When potted, sprinkle them with a little water, and place them in a house where the temperature is from 65 to 70 degrees Fahr. by day, and 55 to 60 by night. This heat is far preferable to a greater during their time of growth, as too much heat, at that period, has a tendency to render the growing shoots both weakly and short.

6. As soon as the young shoots have done growing, which is easily perceived, raise the heat to 80 or 85 degrees by day, and 70 or 75 degrees by night. This increase of heat enables the plants to form their flower-buds with greater facility, strength, and quantity. This increase of heat must always be applied immediately after the plants have perfected their shoots; for if delayed until the wood has become hard, the desired abundance of blossom buds is not attained.

7. When they have completely set their flower-buds, which will be in about three weeks after they have been subjected to the increased temperature, gradually decrease the heat until the end of June, when they may be set out of doors.

8. *Summer quarters.* When placed out of doors at the end of June, always select rather a shady situation; for if placed where fully exposed to the sun, the leaves are not only liable to be blotched and unsightly, but the plants are apt to push their buds prematurely into flower.

9. It is indispensable that every pot be kept free from worms. The safest way of preventing their entrance is to place the pots either on boards, or to put a piece of slate under each. If, however, any worms do effect an entrance, as soon as it is

observed, water the soil in the pot once or twice with a weak solution of lime and water, which will speedily cause them to come out.

10. *Watering.* From the time they are potted until they have finished their growth, give them a plentiful supply of water; and during the summer, whilst out of doors, never allow the soil to become very dry.

11. After they are potted in the spring, commence syringing them with clear water every morning, until both their shoots and buds are formed; and this may be continued in dry weather, once a week throughout summer.

12. *Shading.* Never allow Camellias to be fully exposed to the rays of a mid-day sun. Either place them in a shady situation, or throw a net or mat over the glass, for they invariably flourish and look better under this than any other treatment.

13. *Casting buds.* The great reason why flower-buds very often fall off without properly coming into bloom, is the too sudden changes in the temperature to which they are exposed; for instance, when the buds are nearly ready to expand, a sudden heat causes them to push forth too rapidly; and, on the contrary, a decrease of warmth at that time checks their growth;—and in both cases causes them to fall. It is astonishing how very easily the flower-buds, when nearly ready to expand, are acted upon by either heat or cold; the variation of only a few degrees will considerably affect them: it is therefore absolutely necessary that great attention should be paid to them at that time, particularly if it be in the winter season; in the spring, so much care is not required, as in general each succeeding day is a little warmer than its predecessor; but in the winter months, when the weather is so changeable, and the plants are only excited by artificial means, the greatest care is requisite to keep them from advancing too much, and also not to allow the temperature to decrease, for fear of the flower-buds falling off.

14. *Winter quarters.* About the end of September or beginning of October, or as soon as the weather begins to be very cold or wet, the plants must be taken into the house or frame, or any other cool but sheltered situation, where they must remain till it is wished to bring them into flower.

15. When it is wished to bring any of them into flower, remove them into an increased temperature; this may be done successively, which will greatly prolong the flowering season. The heat required to expand the blossom-buds is about 60 degrees Fahr. by day, and 50 by night. If this be attended to, and the air never allowed to have a much greater or less heat, the plants will continue in flower for a great length of time. It should also be mentioned, that by this heat the plants are not excited to grow.

The foregoing observations apply to plants that are to produce flowers at the usual season. If they are wanted to flower early in the autumn or winter, it is necessary to put them into a growing state at least a month earlier in the spring. They should be got out of doors as early as possible in June, when they will be ready to be brought into the green-house or conservatory to flower by the latter end of August, and so a succession may be continued throughout the winter months, when but few plants cheer us by their expanding blossoms; and if moderate attention be paid, no plant is better calculated for the purpose than the Camellia.

Indeed their beauty need not be confined to the winter months; for they may be made to produce flowers in succession through the whole year, although such as are produced from November to April are usually the finest. A plant of the double white flowered at Chatsworth in 1831 for six months successively: the temperature of the house in which it stood during that time was kept at about 55 to 60 degrees Fahr. by day, and from 50 to 55 by night.

Double Camellias are propagated by grafting, inarching, and budding upon the single stocks: this is much preferable to striking them from cuttings; for although they will grow, yet, like many other plants, they do not flourish so well on their own as on another stock.

The single red Camellias usually make the best stocks. These are easily raised by cuttings, layers, and sometimes by seeds.

16. Cuttings may be put in at any time of the year, except when the plants are making young wood. But they strike the quickest if taken off just after the young shoots have ripened.

17. Cut off the young ripened wood at about three or four joints, trim off the lower leaf or leaves; with a sharp pen-knife make nearly a horizontal cut through the wood close below a joint; plant them in large pans or feeders, filled with sand, and if covered with a glass, they will strike root much sooner.

17. When the cuttings are planted, place them in a vinery or other convenience for a month or so; and afterwards set them in a hot-bed, where they will have a little bottom heat.

18. As soon as they have struck roots pot them in small pots, and set them in a close frame until their roots have again begun to grow; then decrease their temperature, until they are able to bear the same treatment as old plants.

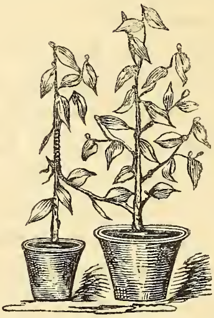
19. Good stocks may be speedily obtained, by planting stools in a pit devoted to that purpose, and laying them in autumn; the following autumn most of the layers will be rooted, when they may be taken off, and potted, and used as stocks the following spring.

20. A few seeds are sometimes obtained from the single red, which should be sown in a mixture of leaf-mould and peat as soon as ripe. The pans in which the seed is sown should be filled half full of broken potshards, and the remainder of the pots filled with a mixture of sand, peat, and leaf-mould. *Seeds* require two years to come up, but they make by far the best stocks. It is advisable to allow these to flower before they are made use of as stocks, as there may be amongst them some new and valuable variety; they will flower about the fifth year, if properly treated, and if nothing new is produced, they still are excellent stocks. To obtain new varieties, it may not be amiss to cross-impregnate the blossoms, by cutting off the stamens before the anthers burst, and when the stigma is in a perfect state, dusting it with the pollen of another kind.

21. *Grafting.* In independent grafting, the mode called side-grafting should be used, and the operation of tongueing left out altogether, or if any, it must be very small; great care is requisite not to cut either stock or scion too deep. It is indispensable that the wood be quite ripe, and then it may be performed either in the autumn or spring before the plants begin to grow. Bind with smooth bass

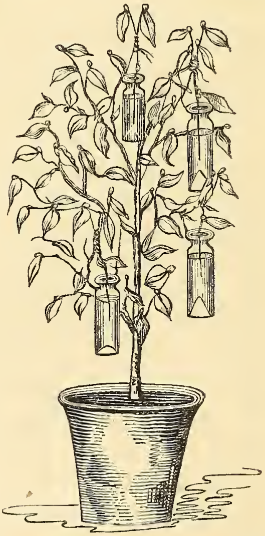
matting and clay after the usual mode, with the exception of heading the stock, which must not be done till thegraft has grown.

22. *Inarching*, or grafting by approach, as figure, is the usual mode resorted to; and is, without doubt, much the safest, and may be performed during the summer and autumn, after the ripening of the wood, or early in the spring, before the plants begin to grow, which is the best time. The scions may be cut from the parent plants in about eight weeks afterwards. The operation is performed in the same manner as the last, with the exception of claying, which is unnecessary. The chief care requisite is to so fix the pot containing the stock, that it may not be disturbed until after the scion is separated from the parent plant.

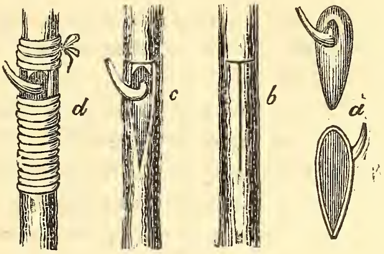


When it is inconvenient to inarch in the usual way, the best method of grafting is that adopted a few years ago by Mr. Pike, gardener to J. W. Brereton, Esq., of Brinton, Norfolk, and latterly practised by us with perfect success at Chatsworth. It consists of detaching a shoot from a plant of the kind intended to be propagated, and inarching it upon a single stock, leaving a piece at the bottom of the cutting sufficiently long to thrust in a phial (see figure below), kept constantly supplied with water. These bottles may be suspended in any part of a large single plant, so that a variety of sorts may be inarched on one plant by means of cuttings brought from any neighbouring garden.

23. *Budding.*—This is performed much in the same way as budding other plants. The common time is July, but it may also be done in the spring. Let the operation, if the weather be warm and sunny, always be done either early in the morning or late in the evening. The mode is this: cut off a shoot with good buds from the plant you wish to propagate; take this branch in your left hand, having the thin end downwards, and make a sloping cut from an inch and a half below the bud to about half an inch or more above the bud, allowing your knife to enter half-way into the wood. Cut off the leaf where the bud is seated, but leave the foot stalk remaining, presenting the appearance of (*a*) p. 37. Put this footstalk between your lips, holding it there whilst with the budding knife you cut two straight lines through the bark of the stock, in the form of a T. (*b*) Then take out the wood from the bark on which the bud is fixed; in doing which be careful not to take the heart or root of the bud away with it. You must, therefore, examine after the wood is disengaged; for if the heart be gone, a small hole will be perceivable; in this case you must try another bud.



After the bud is ready, take the ivory half of your budding-knife, or, for want of that, a piece of wood cut flat with sharp edges, and raise the bark of the stock within the perpendicular bar clearly down to the wood. Having opened these sides wide enough to admit the bark on which the bud is fixed, insert it flat against the wood of the stock; cut off the upper end of the bark attached to the bud, that the edges of the bark of the stock and the bark of the bud may closely meet at the cross bar of the T; then bring the bark of the perpendicular bar over the bark of the bud until it has the appearance of (*c*). Take a piece of well-soaked matting, and begin to bind an inch below the long bar to an inch above the cross bar. Let this be done tightly, and without twisting the matting, as (*d*). In a month or six weeks, if the bud lives, the bandages will require loosening. There is, however, very little dependance of buds growing; we have known them to fail nine instances out of ten.



24. The grafted or budded plants, as soon as the operations are finished, should be kept under a hand-glass, in the green-house, or in a cold frame, until the scion or bud has grown for the first time; and not till then can the heads of the stocks be cut off without great risk of failure; because an exuberance of sap is thus thrown into the scions or buds before they are established to receive it without injury, just as too great a supply of nutriment injures the infant of the human race; nor should the ligatures and clay be removed till that time.

25. When the grafts or buds have grown, and the stock has been headed down, carefully nip off all the tops, leaving only two or three buds to each plant. This precaution will make them grow bushy; when, if left to themselves, they would grow either with a single stem or very straggling, and would eventually require cutting down.

26. When the young plants have been decapitated, they must be kept in a gentle hot bed or a cool part of the hot-house, and they will soon become fine plants; but if any are still inclined to be of a straggling growth, the side shoots should be shortened.

27. No plant bears the knife better than the Camellia. Those who have large and ugly grown plants should prune them freely, re-pot them, and then place them in a little heat of some kind; and, however old the wood may be that is left, it will soon be covered with young shoots.

The Camellia is so universally admired that most persons who have a taste for flowers are anxious to cultivate it; but many are deterred by a supposition that unless they have a green-house or conservatory, they cannot possess so desirable an object with any degree of satisfaction. Although this idea is very prevalent, it is by no means correct: as any person having only a two-light frame may grow it to perfection.

It is well known that the Camellia is nearly hardy: some plants at Wortley Hall have stood the intense frosts of several winters, with no other covering than a common garden-mat; as also at several other places in the north, they have stood some years with a similar protection. There is no doubt but in Devonshire and other places in the south or west of England, it would succeed pretty well if trained against a wall; but as an open shrubbery plant we think it will never flourish in this country: besides, if it were to succeed so as to form flower-buds, at the time it would come into flower, the weather is usually so boisterous that a flower could scarcely be open a day before it would be destroyed. It is evidently more adapted for a conservatory or green-house, where its beauty is become proverbial.

If moderate attention be paid to them in a common frame, they may be grown to a great degree of perfection. All the attention requisite in this situation is to give them plenty of air in mild weather, throughout the winter; to protect them well from frost with litter, old hay, or mats; and to keep a higher temperature in the frame at the time they are growing, and forming their flower buds, than at any other season. A few plants may be taken out of the frame about Christmas, and placed in the window of a warm room, where they will flower for a long time; and these may again be succeeded by others; and thus a succession may be kept up for several months.

The Camellia, like the orange, but in a much less degree, is subject to the scaly bug (*coccus*). The only *effectual* remedy is to pick them off, and rub the parts affected with a little soft soap. The green fly (*aphis*), will sometimes attack the young green wood: here immediate smoking with tobacco is the remedy. By frequently syringing the leaves during the summer, and washing them with a sponge two or three times in the course of the winter, the health of the plants will be improved, the attacks of the insects prevented, and the beauty of the foliage shown to more advantage.

SELECT LIST OF THE VARIETIES AND SPECIES.

White.

C. Japonica, flora plena alba
— fimbriata
— anemoneflora alba
— Welbankii
— Sabiniana
— excelsa
— alba simplex
— compacta.

Red.

C. Japonica
— rubra plena
— anemoneflora
— carnea
— myrtifolia
— splendens
— crassinervis
— rubicaulis
— Reevesiana
— concinna
— Rossii.

Buff or Light Yellow.

C. Japonica, incarnata.

Changeable Coloured.

C. Japonica, pompona.

Very Dark Red.

C. Japonica, corallina
— papaveracea.

White Ground, Spotted or Striped with Red.

C. Japonica, punctata
— rosa mundi
— splendida
— Colvillii.

Red Ground, Striped with White.

C. Japonica, variegata
— dianthiflora
— Wiltonii
— Chandleri
— speciosa
— Parksii.

Light Red.

C. Japonica, pæoniflora
— eximia
— imbricata
— rosa sinensis
— rosea
— Woodsii
— elegans.

Very Light Red.

C. sasanqua rosea.

OPERATIONS FOR MARCH.

Annuals, both hardy and tender, must be sown this month. In cold situations do not sow the hardy ones till towards the end; for the mode of proceeding see page 18, and for a selection page 22.

Auriculas must be watered at least once a week with liquid manure, at all the other waterings at this season use pure water. See page 9.

Carnations about the end; last years' layers should be planted off into large pots 10 inches wide and 8 inches deep, filled with a mixture of good rich loam, well rotted dung, and sand.

Currant. The red flowering and other ornamental species may be propagated by cuttings in the beginning.

Camellias. For their treatment see page 33.

Dahlias. If not already excited, should be plunged in a little heat as early as possible. Also sow the seeds if not done last month.

Hydrangeas. Put in cuttings of the last year's wood, which possess plump buds; plant each in a small pot filled with sandy loam and peat. Pot the old plants, if not done before. To obtain blue flowers mix about one-twentieth part of iron filings in the soil, in which the plant is potted. Or mix a portion of sheep's manure with the soil, and water during the spring months with a solution of sheep dung and water.

Ipomopsis. For the treatment of, see page 27.

Pelargoniums now struck in a hot-bed frame, and potted off as soon as rooted, will flower in October.

Plants in rooms and bulbs in glasses, must be treated as recommended, below.

Ranunculuses. Plant all the fine leaved varieties, if not previously done. See page 42.

Rose Trees in pots, placed in a forcing-house in the middle, will produce flowers by the middle of May. See page 23.

Schizanthus Retusus and other species and varieties, which were sown in the autumn, will require shifting into larger pots about the beginning. See page 5.

Tube Roses as recommended last month.

Tulip Beds should be examined on a fine sunny day, and if any of the roots are affected with canker, which will be known by the leaves appearing sickly, take off the infected parts, and expose the root to the effects of the sun and air; the wound will speedily heal.

MANAGEMENT OF PLANTS IN ROOMS.

To treat on the proper management of plants in houses, is a subject attended with considerable difficulty; every genus requiring some variation both in soil, water, and general treatment. If the room where the plants are intended to be placed, is dark and close, but few will ever thrive in it;—if, on the contrary, it is light and airy, with the windows in a suitable aspect to receive the sun, plants will do nearly as well as in a green-house. But if they are observed to suffer, the effects may generally be traced to one of the four following causes:—Want of proper light and air,—injudicious watering,—filthiness collected on the leaves,—or, being potted in unsuitable soil.

1. *Want of proper light and air,*—is perhaps the most essential point of any to be considered; for, however well all other requisites are attended to, a deficiency in either of these, will cause the plants to grow weak and sickly. Let them always be placed as near the light as they can conveniently stand, and receive as much air as can be admitted, when the weather will allow. Indeed those persons who have no other conveniency than the house to keep them in, will find that they derive immense advantage from being, during fine weather, in spring and autumn, turned out of doors in the evening, and taken in again in the morning,—the night-dews contributing greatly to their health and vigour.

2. *Injurious watering,*—does more injury to plants in rooms than many persons imagine. To prevent the soil ever having a dry appearance, is an object of importance in the estimation of very many; they therefore water to such an excess, that the mould becomes sodden, and the roots consequently perish.—Others, to avoid this evil, run exactly into the opposite extreme, and scarcely give sufficient to sustain life. This, however, is by no means so common a practice as that of giving too much; for in general, if any thing appears to be the matter with the plants, large doses of water are immediately resorted to; and if recovery is not speedy, this nostrum is again administered, with but little doubt of its infallible restorative powers:—but such persons, like an unskilful physician who gluts the weakly stomach of his patient, only hasten on what they are trying to prevent. This overplus of water will show its bad effects by the very dark colour and flabby disposition of the leaves; and if the plant receives too little, the leaves will turn yellow, and eventually die.

The best plan is, to always allow the soil in the pot to have the appearance of dryness, (but never sufficient to make the plant flag,) before a supply of water is given, which should then be pretty copious; but always empty it out of the pan or feeder in which the pot stands, as soon as the soil is properly drained. The water used for the purpose, ought always to be made about the same temperature as the room in which the plants grow,—never use it fresh from the pump,—either let it stand in a warm room all night, or take off the chill by adding a little warm water to it, or the growth of the plants will be much checked.

3rd. *Filthiness collected on the leaves,*—may either arise from insects, or dust; the former may be speedily remedied, by placing the plants under a hand-glass, or any thing that is convenient, and burning some tobacco until they become well enveloped in the smoke;—and the latter may be removed by occasionally washing them on the head with pure water, either by means of a syringe, the rose of a watering-pan, or with a sponge, when the filth still adheres.

4th. *Being potted in unsuitable soil,*—is by far the most difficult part of the business to rectify, for no certain line can be drawn, unless each genus was treated on separately; however, as this cannot be done in a paper like the present, a few general remarks, which, perhaps with some little exceptions, may be found to be pretty correct, must suffice.

All plants whose branches are fragile or slender, and roots of a fine thready, fibrous texture, with general habits like the *Ericæ*, as *Diósma*, *Andersónia*, *Epàcris*, &c. will require the same soil, (peat earth) and very similar treatment to Cape Heaths. Those whose wood and general habits partially differ, and whose roots are of a stronger texture, as *Acacia*, *Ardisia*, *Stenocarpus*, *Tetrathica*, *Tristanea*, &c., will require a portion of sandy loam,—in many cases about equal parts; and where the habits, &c. differ materially from the heath, only a small portion of peat earth will be required, and a compost may be made a little rich, by the addition of well rotted dung.

Almost all Cape and other bulbs, as *Sparaxis*, *Ixia*, *Gladiolus*, *Tritonia*, &c., thrive best in a mixture of light rich sandy loam, leaf mould, and a little peat. Shrubby and herbaceous plants, with luxuriant roots and branches, as several species of *Myrtus*, *Jasminum*, *Hibiscus*, *Hermannia*, *Heliotropium*, &c. require rich loam, lightened with leaf soil, without any portion of peat. Plants with powerful roots, and but slender heads, as *Veronica*, *Senecia*, *Scutellaria*, *Ruellia*, *Maurandia*, &c., require a light sandy soil, mixed with a small portion of leaf mould and very rotten dung. At the time of potting, always lay plenty of broken potsherds at the bottom of each pot, to give a good drainage.

It will be seen that these directions do not allude to either orchideous, succulent, or aquatic plants. Many of the orchideæ require a portion of decayed wood mixing with the soil:—others grow in damp moss; but these being chiefly stove plants, will not flourish in a room; there are several species, however, that thrive very well both in the green-house and in rooms, as *Arethusa*, *Calopogon*, *Dendrobrium*, *Ophrys*, &c.: the soil suitable for these is a mixture of about equal parts of light sandy loam and peat; very little or no water must be given when they are not in a growing state.

Succulent plants of all descriptions require very little water, and in general are very easily managed in rooms; many of them thrive in a mixture of sandy soil and lime rubbish, as *Aloe*, *Cacalia*, *Cactus*, *Aizoon*, &c.; others grow well in a mixture of equal parts of light sandy loam and peat, as *Coris*, *Cotyledon*, *Mesembryanthemum*, &c.

Aquatic Plants, as *Villarsia*, *Actinocarpus*, &c., generally do well in a mixture of peat and loam, and require to be constantly kept in a wet state; indeed the best way is to place the pot in a deep pan or feeder, which should always be kept filled with water.

Bulbs of most sorts flourish in rooms with less care than most other kinds of plants. Hyacinths should be planted in autumn. In preparing pots for them, select such as are about four inches deep and three inches wide, put a little rotten dung in each pot, fill each pot up with light rich soil, and plant the bulbs so shallow that nearly half the bulb stands above the soil; plunge the pots in the open air, and cover them six or eight inches deep with rotten bark. During spring take them out as they are wanted to bring into flower, and set them in the window of a warm room where they will be fully exposed to the sun. Those who do not possess a garden may set the pots in a cellar or outhouse, or in the corner of a yard, and cover them with light soil or sand until they are wanted to bring into the room to flower. When the leaves begin to decay after they have done flowering give them no water;

when the leaves are dead, take them out of the soil and remove the offsets, and lay them in an airy situation until the time of planting.

If grown in water glasses, they require to be placed in a light airy situation, and the water will require to be changed once in three or four days. If drawn up weakly, it will be necessary to support the stems with sticks, split at the bottom so as to fit on the edge of the glasses at the top. This however will not be necessary if they be kept in a light and airy situation. When out of flower plant them in pots of soil to perfect their leaves, and treat them as above; they will then flower again the succeeding year. The Narcissus too requires a treatment perfectly simple; and for Cape bulbs see page 8, where the whole process of culture is detailed.

CULTURE OF THE RANUNCULUS.

The species of Ranunculus most worthy of the cultivator's care are, *rutæfolius, isopyroides, glacialis, alpestris, aconitifolius, platanifolius, amplexicaulis, Pyrenæus, gramineus, gracilis, fumariæfolius, Illyricus, acris flore-pleno, repens flore-pleno, macropetalus, Krapfia, Asiaticus* and *parnassifolius.*

The first section in this genus are all aquatic plants, and not worth cultivation. The *aquatilis* makes a handsome show in our ponds and rivers. Dr. Pulteney contradicts the assertions of its deleterious qualities, and proves that it is not merely innoxious, but nutritive to cattle, and capable of being converted to useful purposes in agricultural economy. "In the neighbourhood of Kingswood, on the borders of the Avon, some of the cottagers support their cows, and even horses, almost wholly by this plant. A man collects a quantity every morning, and brings it in a boat to the edge of the water, from which the cows eat it with great avidity, insomuch that they stint them, and allow only about twenty-five or thirty pounds to each cow daily. One man kept five cows and one horse so much on this plant, with the little that the heath afforded, that they had not consumed more than half a ton of hay throughout the whole year, none being used except when the river was frozen over. Hogs are also fed with this plant, and improve so well on it, that it is not necessary to give them any other sustenance till they are put up to fatten. This property of water-crowfoot is the more remarkable, as all the species have been deemed acrimonious, and some of them are without doubt highly so."—*Don's Miller's Dict.*

The *rutæfolius, isopyroides, glacialis, alpestris, aconitifolius, pyrenæus, amplexicaulis, parnassifolius, gramineus, acris flore-pleno,* and *repens flore-pleno,* will thrive in any kind of soil, but moist situations suit them best. The *parnassifolius* is rather scarce, on account of its being so subject to the attacks of snails and slugs in the spring months. As these plants are generally grown in beds, the Bygrave slug-preventer, figured page 17, will effectually prevent the depredations of these crawling enemies, and it could be fixed round the bed with little trouble. The soil in which they thrive best is equal parts of hazelly loam, vegetable mould, and peat. The usual mode of propagation is by seeds.

The *gracilis*, *fumariæfolius*, *macropetalus*, *Illyricus*, *Krapfia*, and *Asiaticus*, will grow in any common garden soil, either in a wet or dry situation; these are usually increased by offsets from the roots, and occasionally from seeds. The *Asiaticus* is the common Ranunculus of florists, the numerous varieties and sub-varieties of which make such a splendid show in our gardens in May and June.

To grow the garden Ranunculus to great perfection, it is necessary to subject it to a peculiar treatment. Good rich soil is indispensable, and plenty of rotten manure is a desideratum; but certain rules must be attended to, or they will not flourish; and therefore,

1. The Ranunculus prefers a fresh loamy soil, rather inclined to be strong than otherwise; it also requires to be well manured. Therefore, in preparing a bed, take out the old soil to the depth of one foot or more at the bottom of this trench, lay about six inches thickness of well rotted cow-dung at the bottom of the trench; then obtain some good rich loam, and break it well, mixing about one-eighth of very well rotted cow-dung with it; then fill the trench with the compost to six inches above the level of the surrounding surface, forming a slope on each side from the middle. This should not be done later than the beginning of October.

2. Plant all the broad-leaved varieties about the end of October or beginning of November, and cover them with some long litter, to prevent their being damaged by the frost; but, if possible, delay planting the narrow-leaved ones until February or March; for the latter evidently suffer more from severe weather than the former, whilst the broad-leaved ones appear to suffer more than the latter by being kept in a dry state all winter; and if kept in sand, they are liable to become mouldy.

3. In planting, either during the autumn or spring, never plant in either holes or drills, a practice not uncommon; but, having marked with a rod some lines across the bed four or six inches apart, place the roots carefully with the crowns upwards, four inches apart in the rows, and lay a portion of sand round and upon each root, and then cover them with not more than two inches thickness of light dry soil.

4. Never select the largest roots to plant for a flowering-bed, for they generally divide into offsets, and seldom flower well; choose the middle size, and your expectations will not be disappointed.

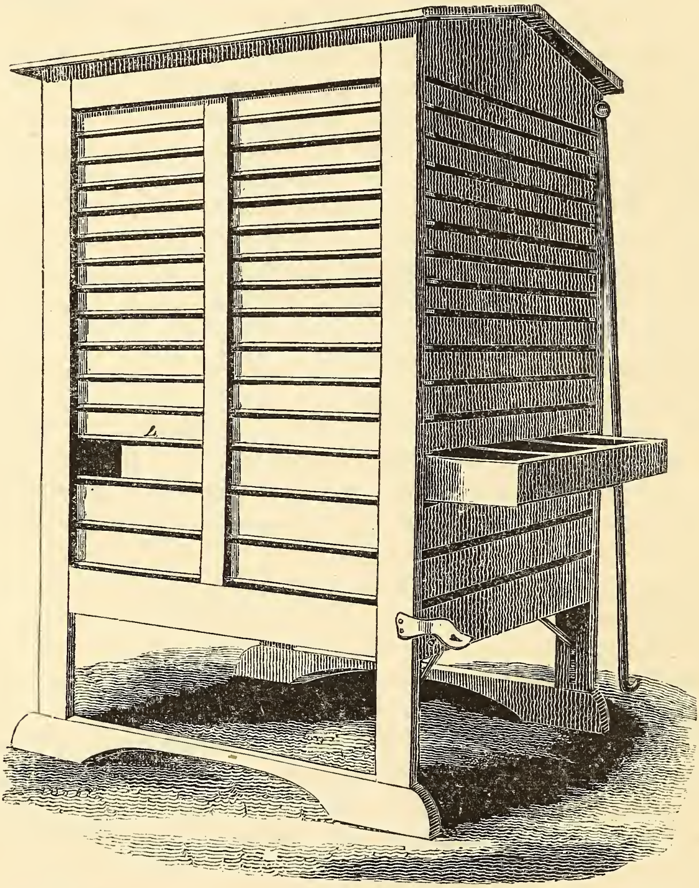
5. It is indispensable that the roots never be allowed to come in contact with raw dung, or they are sure to become more or less diseased. To prevent this, when the roots are taken up, dig the bed to the bottom, turning up and mixing the old cow-dung well with the soil; when dahlias or ornamental plants may be planted on it till the beginning of October, when the bed should be again trenched, and another layer of cow-dung placed under the soil as before. Take off from the surface about four inches thickness of the old soil and lay on two inches of new loam; plant on this new soil, using sand, and covering with light dry sandy loam as before.

6. It is indispensible that no raw turf be in the soil in which the roots are planted, or they will be materially injured by coming in contact with it.

7. When the leaves appear above ground, choose a dry day and press the soil firmly about the roots with the hand, as if the weather proves dry, and the crowns of the roots happen to be exposed, they will suffer material injury.

8. In dry weather they will require watering, and this must be continued, if they require it, until they are in full blow.

9. In all situations where the sun has great power, shading must be resorted to, or the leaves will become yellow, and but few flowers will be produced. In all situations shading is necessary when they come into flower, or the flowers will neither be true to their colours, nor the roots so fine as they otherwise would be. This shading may be done either by means of an awning, or hoops and mats; by whatever means it is done, a free current of air must be allowed to pass underneath, or the stems will be weakly and unable to support the flowers. No covering should be nearer the ground than a foot and a half, or two feet.



10. Never allow the roots to remain in the ground after the herbage disappears. The best way of keeping them is in trays or drawers with wire bottoms, and divisions to hold a certain number of the roots of each sort; as the tops die the roots are taken up, and after being picked clean, are placed in the compartments, which are either numbered and placed on a list, or the names themselves are pasted in each compartment. When all are taken up, the trays are placed in a stand in

an airy chamber, but not exposed to the sun. At a leisure time the offsets may be separated and the roots selected for the following year.

11. If it is desired to obtain flowers late in the season, let the bed on which they are planted be raised no higher than the surrounding surface: by this means it will retain more moisture; plant the roots in the usual way, and give the bed a good watering with lime-water to destroy the worms. Afterwards keep the bed well watered with a thin solution of cow-dung and water, until the leaves appear. After they have come up, it is necessary to constantly shade, from ten o'clock in the morning to four or five o'clock in the afternoon, in sunny days; and this must be continued until they have done flowering.

12. To obtain early Ranunculuses plant in a frame in September, and they will come into flower in January and February. Select roots for this purpose which have been kept out of the ground the previous season of planting, if this is convenient; as they will grow much quicker than those which have been taken up the previous summer. Some may also be planted in pots in the beginning of August; and if they be brought into the green-house at different times, a bloom may be kept up from October to February.

13. For a bloom the whole year, begin to plant in February, and plant every fortnight. For a bloom in May plant in February; for a bloom in July plant in April; for a bloom in September plant in June; and for a bloom in October plant about the middle of July. After this commence planting in frames for winter flowering.

14. *To raise good varieties from seed.* "The system consists in having some of the best show flowers of each class, which produce a pericarpium, or seed vessel, either dark, white, scarlet, crimson, yellow, striped, &c.: and a number of the best semi-doubles of each corresponding class, producing anthers as well as pericarps. Then if a new dark flower is wanted, fertilise *Naxara*, *Variat*, *Quixos*, or any good dark flower with the pollen of a dark semi-double or nearly double flower, containing the best properties as to colour, shape of petals, and general habit. If a superior flower, with a yellow ground and dark edging, be desired, then fertilise *Grand Monarque*, *Julius*, or *Grand Berger*, with the pollen of a yellow-edged flower, of first-rate properties. Those that have the greatest number of petals are to be preferred, so that they have anthers producing farina. A similar method must be pursued to obtain a superior flower of any other class. The seed generated in this way will certainly produce some fine varieties*." Mr. Sweet recommends that the yellow be fertilised by black, the scarlet or crimson with white or yellow, and all the most distant intermixtures.

15. Sow the seed at the latter end of October or very early in February. Either boxes or pans will do for the purpose; give them plenty of drainage by laying a quantity of broken potsherds at the bottom, fill the boxes or pans with light loam; sow the seeds thin and cover them as lightly as possible; water them with a very fine rose watering-pot, and place them in a cold frame or pit.

The plants will be up in about a month or six weeks. They must then receive air night and day, if the weather will permit. They must, however, be carefully preserved from frost. Top-dress them with a little fresh soil about the end of February or beginning of March, taking away a portion of the old soil. About the middle of May, plunge the boxes or pots in the open ground, and water them until the tops die. When this is the case, take them up and treat them as old roots; and the year following they will in general flower.

---

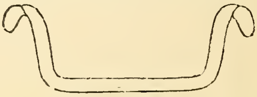
* Gard. Mag.

A good Ranunculus should have a strong stem, from eight to twelve inches high. The flower should be perfectly round, at least two inches in diameter, consisting of numerous petals, gradually diminishing in size to the centre, lying over each other, so as neither to be too close nor too much separated, but having more of a perpendicular than of a horizontal direction, in order to display the colours with better effect. The petals with entire rounded edges, their colours dark, clear, rich, or brilliant; either of one colour, or variously diversified on an ash, white, sulphur, or fire coloured ground, or else regularly striped, spotted, or mottled, in an elegant manner.

ON REMOVING AND SUPPORTING DETACHED TREES, OR PLANTING SHRUBBERIES FOR ORNAMENT.

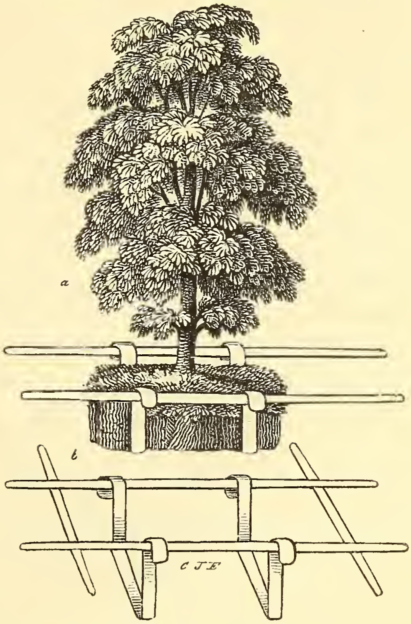
All deciduous trees it is wished to remove should be done as early as possible in this month, before the buds expand. Evergreens, in general, if taken up carefully, may be planted with success at any season of the year, providing dull or dripping weather be taken advantage of for the purpose. There are particular seasons, however, when they will thrive with much greater freedom than at others. If the situation be dry, and the soil light and sandy, they should be planted (with the exception of *hollies*) in November and December, if the weather be mild; on the other hand, if the situation be low, and the soil retentive of moisture, they should be planted in May. In both cases, it is indispensable that all large trees or shrubs be removed with good balls, and that the roots be uninjured. Hollies, if planted in any situation, should always be removed from the end of May to the end of June.

In detailing the method of removing large trees, whether deciduous or evergreens, we cannot improve upon the system of E. Jesse, Esq. given in the Horticultural Register, Vol. I. p. 760. Excavate the earth at some distance from the tree; leaving all the principal fibres, and the earth adhering to them, in a compact ball, undermining as much as possible, and taking care not to shake or injure the ball by twisting the stem of the tree, or using it as a lever to loosen the tap roots; when this is done, and a hole made where the tree is to be placed, adopt the following mode:—Two pieces of iron must be previously formed, of the breadth and thickness of a common cart-wheel tire, three or four inches wide, rather more than half an inch thick, and about six feet long, bent in the form of the figure, which will reduce it to three feet across. This will do for trees requiring from two to four men to lift them; but a size larger and stronger in proportion will be wanted for trees which will require eight



or ten men or more to carry them. Put these irons under the ball of earth, as near the centre as possible, leaving a space between them of about two feet, and for larger trees a little more: run two strong poles about eight or ten feet long, and three or four inches in diameter, but smaller at each end. Apply these poles as shown in the sketch, to each side, passing them through the bends of the irons, so as to form a complete hand-barrow; the tree may then be lifted.

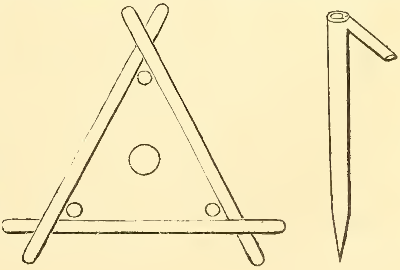
Cross levers may be used for larger trees, which require more men, as (*b*), so that as many men can conveniently apply their strength to it as are wanted, without being in each other's way. The whole is fixed and unfixed without any loss of time, and requires no tying, nor is there any danger of its slipping off. The roots which extend beyond the ball are cut off at the further side of the trench, and are left projecting. In taking up the tree, it is advisable to go much wider with the spade *from* it than the ball is intended to be; the size of the ball may be afterwards reduced with a pick, so that scarcely a root will be materially injured.



In planting, spread the projecting roots out carefully in different layers, as near as possible to their original position, as the hole is gradually filled with mould. The best way of forming the ball, is to prepare it the year before the tree is to be taken up. This is to be done by digging round, and cutting most of the principal roots. In removing very large trees, the taps and other large roots, which cannot conveniently be got at, may be separated by means of a long chisel applied under the ball of earth. In moderate-sized trees this is not required.

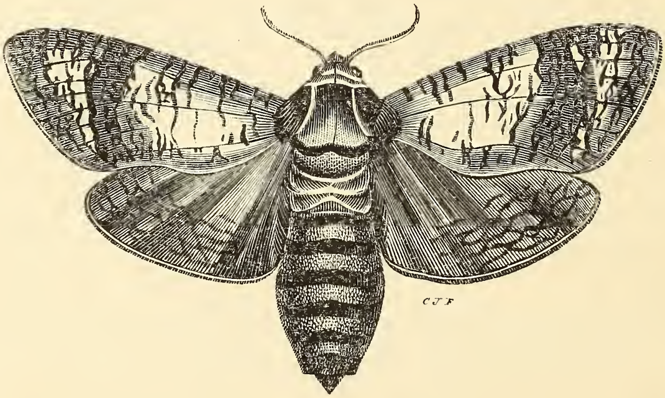
In some situations, trees and shrubs planted as above will scarcely require supporting, as the large ball of earth will steady them sufficiently; but on exposed lawns they will scarcely be safe without some kind of support. Various have been the means resorted to for supporting newly-planted trees: all the usual methods have proved partly ineffectual, as they invariably caused either a partial or total destruction of the trees they were intended to preserve. To prevent the evils arising from the friction of stakes and bandages, many persons plant their trees so deep, that to avoid destroying them one way, they actually do it another.

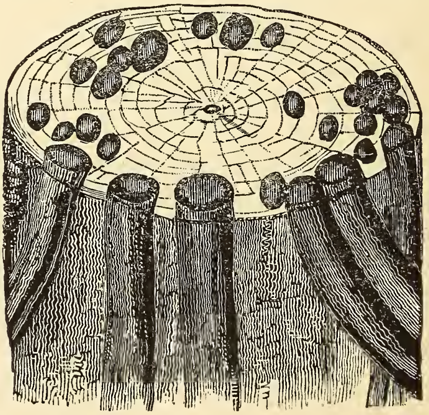
The best system of support, and one which we have practised at Chatsworth, with the most perfect success, is the following. Obtain three straight pieces of wood, and lay

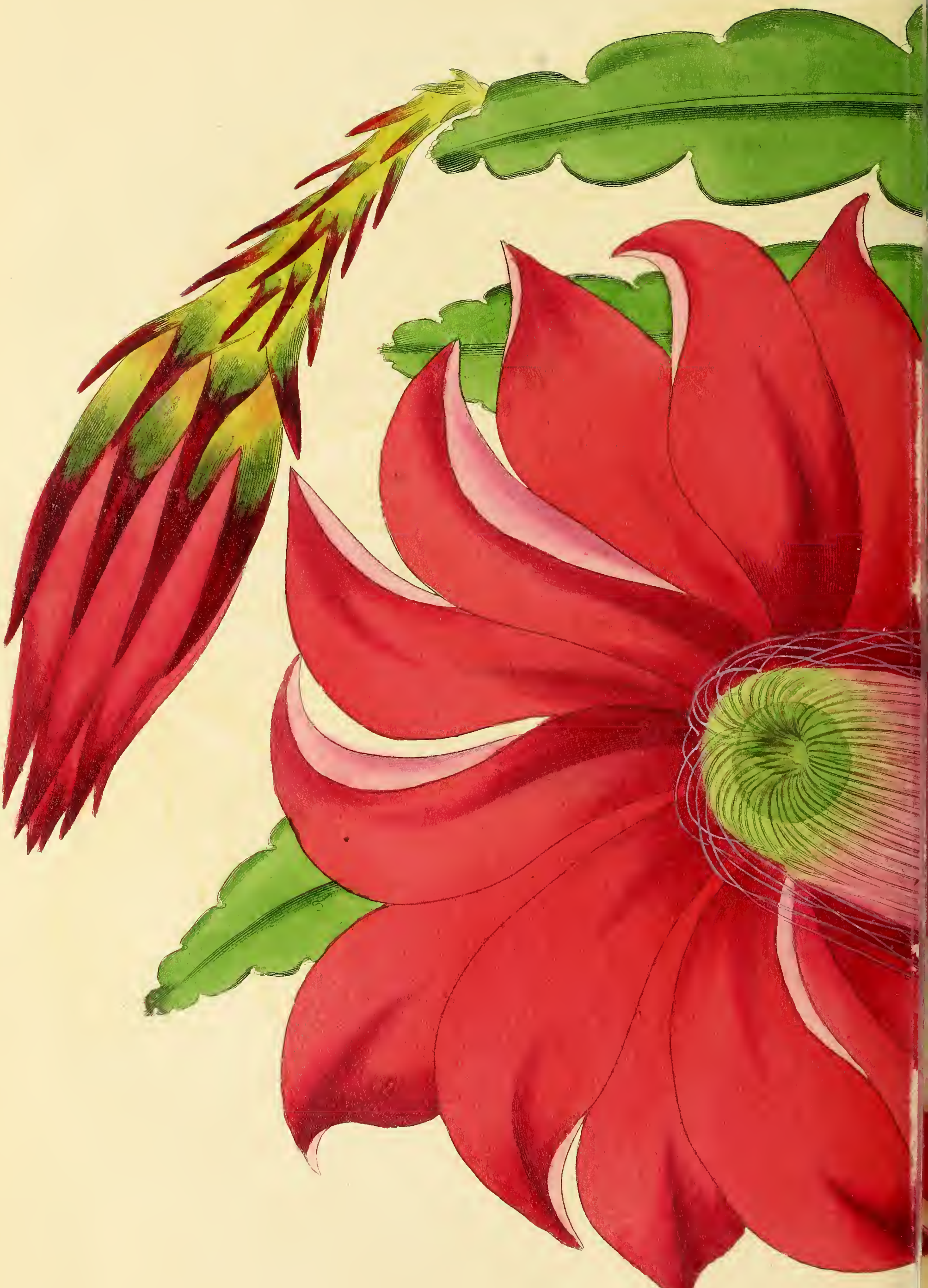


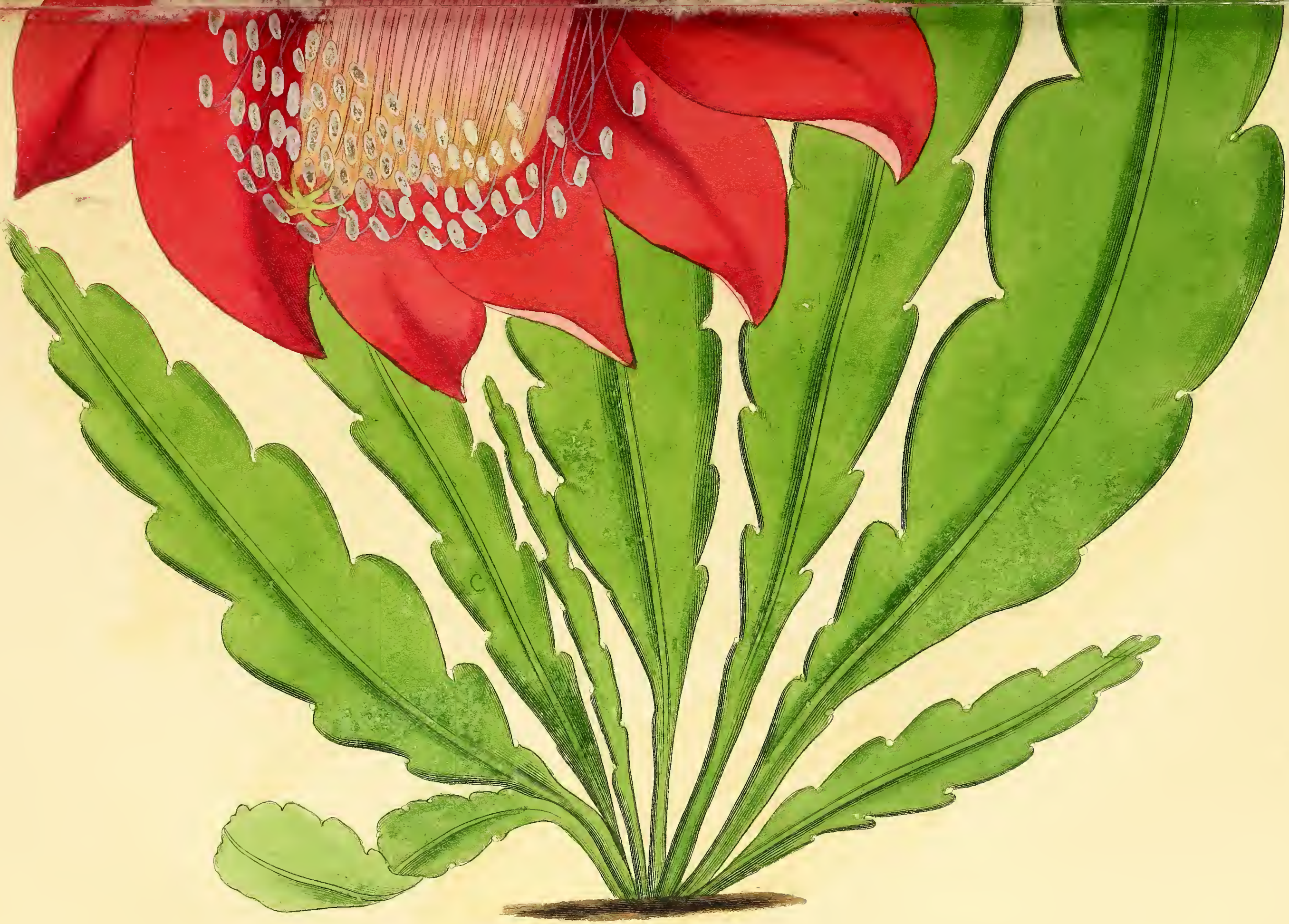
them in a triangular form, as the figure. These pieces must be proportioned according to the size of the tree, and three hooked stakes must be provided for each corner. When the tree is placed in the hole, the roots spread out, and the earth, after being broken and pulverised, well shaken amongst them, the three straight pieces are placed in a triangular form, round the stem of the tree, on the top of the ball, and the triangle made large enough for a hooked stake to be driven in at each angle, so as not to injure the roots. The support being thus completed, the earth is filled in, and the tree stands perfectly fast. In some situations, it will be advisable to make holes for the hooked stakes with an iron bar. The stakes must be driven down sufficiently deep for the turf to be laid evenly over the top. It matters little of what kind of wood they are made: any sort will last as long as necessary.

The alder, the willow, and sometimes the oak and ash, when planted in low, watery situations, are subject to the attacks of the larva of the Goat Moth, (*Cossus ligniperda,*) which perforates the wood to such an extent (as shown in the figure) that even a moderate blast of wind will break off a good-sized tree. Whether the greater quantity of water absorbed by the trees in wet situations render them more palatable; whether the soft wood being more porous, and offering less opposition to their progress be the cause of their infesting them; or whether their attacks do not commence until the trees themselves have become diseased, is still a matter of uncertainty. This, however, we find to be certain, that often one tree in a low situation is much infested by the insects, whilst another in a similar situation appears to be perfectly free from their attacks, and grows free and vigorous; and nearly all in dry situations are free from them.

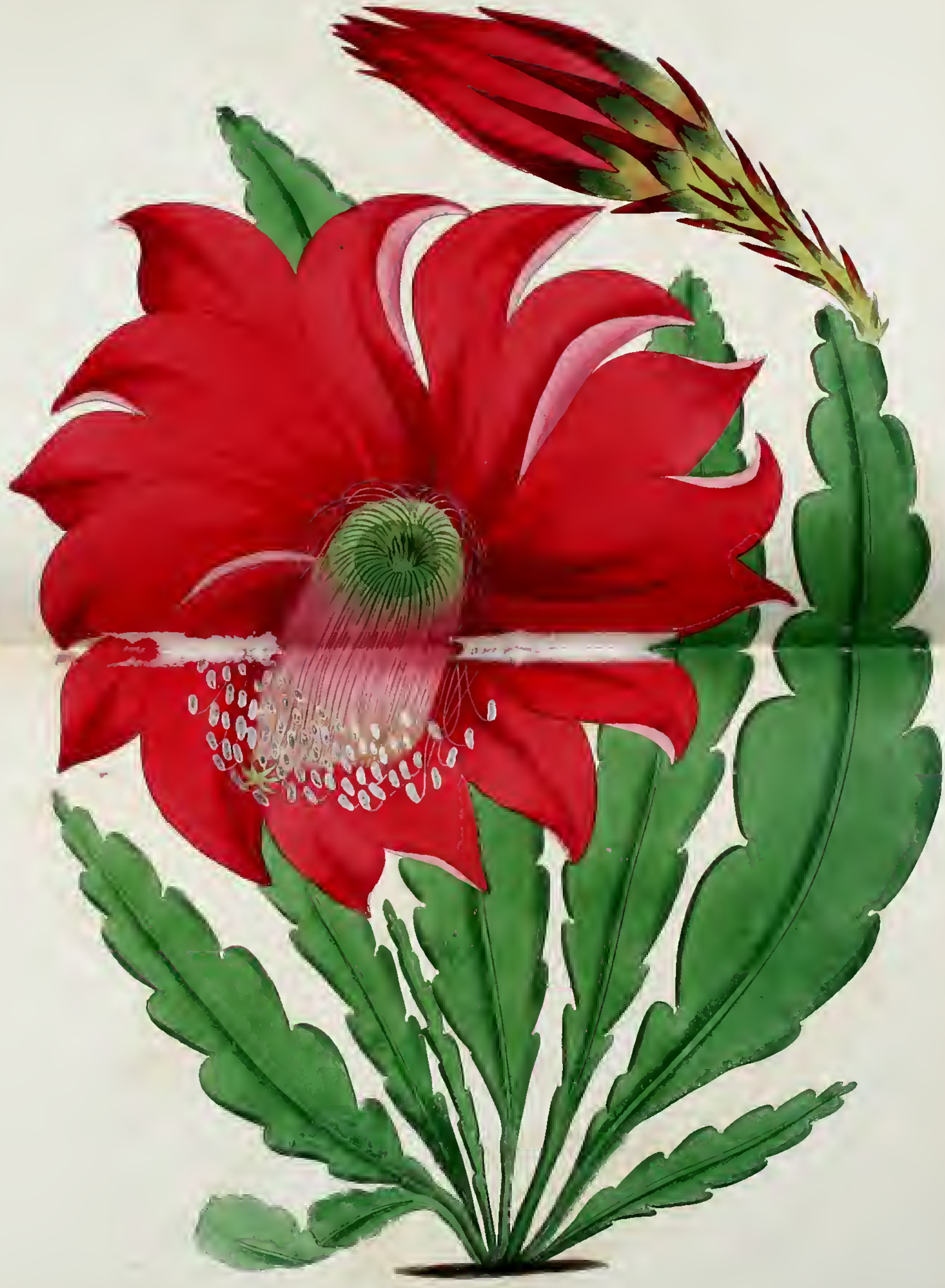








Epiphyllum Splendidum.



Epiphyllum Splendidum ?.

EPIPHYLLUM SPLENDIDUM.

SPLENDID EPIPHYLLUM.

CLASS.	ORDER.
ICOSANDRIA.	MONOGYNIA.

NATURAL ORDER.

CACTEÆ.

Generic Character.—*Sepals* imbricated, numerous, confounded with the corolla. *Corolla* indefinite. *Branches* leaf-like, fleshy, usually smooth, but sometimes with a few bristle-like spines ; each leaf-like branch with a midrib having parallel side ribs, which terminate at the indentations of the edges. Flowers proceeding from the extremity of the midrib either at the side or the top of the branch. *Stamens* numerous.

Specific Character.—Branches ensiform, flat, with spreading teeth, and smooth. Flowers in the indentations of the leaf-like branches at the sides, chiefly near the extremity, solitary, very large, from six to ten inches diameter, rich carmine colour ; petals oblong, each terminating in a fine point. Stamens light rose colour, slender, two-thirds as long as the petals, anthers white ; style equal in length to the stamens, terminating in six stigmas.

We obtained the present very splendid species from the celebrated collection of succulents at that time in the possession of Mr. Hitchen of Norwich, but since purchased by Mr. Mackay, nurseryman of that place. All admirers of this novel tribe of plants are much indebted to Mr. Hitchen for the valuable additions he has latterly made to those previously cultivated in this country. The present species is a native of Mexico, from whence it has been lately introduced: its flowers were stated to be ten inches broad, which we feel not the shadow of a doubt about, as ours, though a very small plant, measured when in full blow eight inches in diameter.

We placed it in the stove, potting it in a mixture of sandy loam, and a small portion of brick rubbish, and treated it in the same manner as *C. speciosus, speciosissimus, &c.* It came into flower in October last, when our drawing was taken. It certainly, without exception, far surpasses in size and splendour of the flower any species or variety at present known : both the *speciosissimus* and even the *grandiflora* will not bear a comparison with it for size. It is entirely destitute of that beautiful purple so characteristic of the flowers of the *C. speciosissimus*, and has something of an orange colour, all the petals being nearly transparent. In point of the shape of the flower, and in some other respects, it bears a good deal of resemblance to the *C. speciosissimus*.

All the stove species of *Cactæ* may be treated as follows :—

1. Pot them in loam and peat, or sandy loam, mixed with a small portion of lime rubbish, say about a fourth part.

2. Always let the pots in which they are planted be as small as the plants will

allow; large pots are injurious, because the roots are prevented from reaching the sides for so long a time, and the body of soil is liable to retain too much moisture every time the plant is watered.

3. Always give a good drainage by laying in each pot a good portion of broken potsherds, as the least stagnation is always injurious, sometimes fatal; therefore, never allow water to stand in the pans or feeders, in which the pots are sometimes placed.

4. Water very seldom, not more than twice a week when they are flowering, and not so often at other times; give very little at a time, not more than will just moisten the soil all over, particularly if the weather is not fine and sunny.

5. About the middle of June turn them out of doors, into a situation where they will not be exposed to winds, but perfectly open to the rays of the mid-day sun. Place them on a board or floor of any kind, to prevent the worms from effecting an entrance through the bottoms of the pots. This system of exposing them in summer gives them a check which seldom fails to produce a good bloom.

6. Whilst out of doors they must not be allowed to receive the heavy dashing rains, or they will suffer, perhaps die in consequence; either a boarded roof or other shelter must be provided for them on such occasions. Also if the pots stand on a floor of slates or flag stones, they should be partly plunged in a little moss, as the sun, by heating the pots, sometimes burns the roots of the plants.

7. In September take the plants into the green-house, and place them in a situation where they will receive plenty of light and air during winter.

8. Early in the spring remove them into the stove in succession, as they are wanted to flower.

Most of the species will flower very fine without being placed out of doors at all; but by placing them out as above, the flowers will be much finer and more abundant than when grown regularly in the house; they may be increased by cuttings, seeds, and grafting.

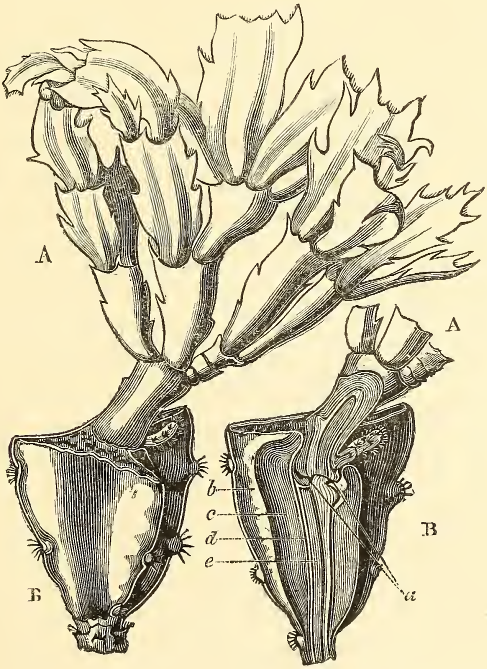
9. Take off the cuttings at the length required, and lay them on a shelf in the greenhouse, &c., to dry up the wound made by the knife. Let them remain on the shelf until they begin to have a shrivelled appearance, say a week or fortnight: then pot them in small pots in the same compost as recommended for old plants; set them on a shelf as near the glass as convenient, and be particularly cautious not to over-water them.

10. Sow the seed in the wet state, immediately after being gathered from the plant and rubbed out of the husk. For this purpose fill a pot with a mixture of equal parts of peat earth and sand, cover it lightly, and plunge the pots in a hot-bed: if the seed be good, it will make its appearance in a month afterwards.

11. The operation of grafting is very simple, merely requiring an incision to be made, and fitting in it a fresh cutting of another kind, rubbing a little clay over the wound to keep out the air. The union is soon effected, and the new branch grows freely.

" In the case of plants with succulent leaves it has been asserted, on authority, that the union is imperfect, from the adhesion being by the cellular substance only, no woody matter being transmitted to the stock. That this is quite erroneous, is shown by the instance of a *C. truncatus* grafted on a *C. triangularis*, in the king's garden at Neuilly, as beautifully dissected and drawn by M. Turpin. A, is the *C. truncatus;* B, *C. triangularis; a,* the line of junction of the two individuals ; *b,* the cuticular membrane ; *c,* the cellular tissue of the bark ; *d,* the fibrous and tubular tissue of the wood ; *e,* the cellular tissue of the centre of the pith*."

*Rennie's Alphabet of Gardening.



EPACRIS GRANDIFLORA.

GREAT-FLOWERED EPACRIS.

CLASS.
PENTANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
EPACRIDEÆ.

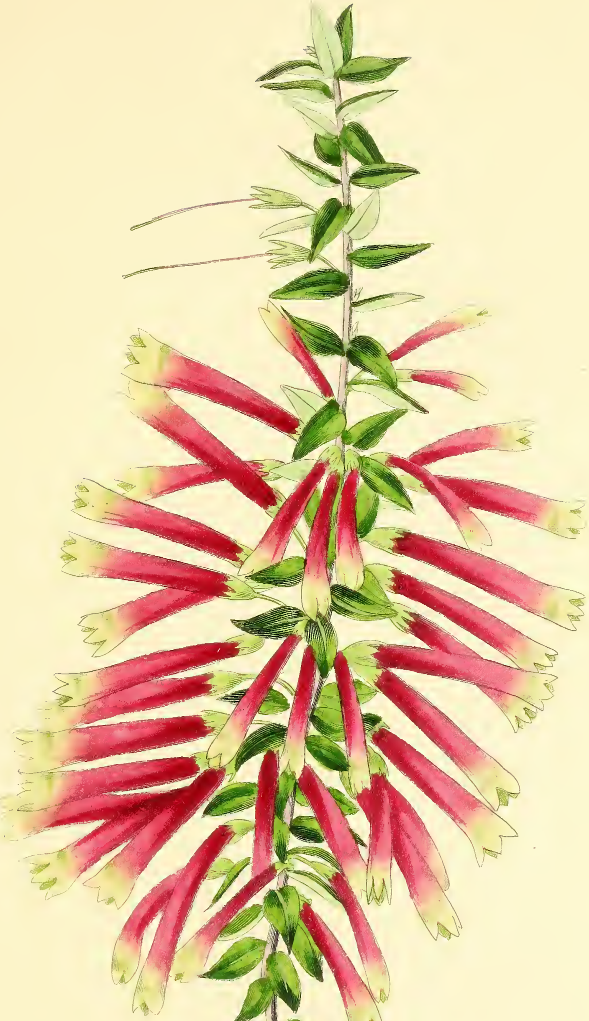
Generic Character.—*Calyx* scaled, or the parts of it laid over each other like the tiles of a house. *Corolla* a tube. *Stamina* inserted in the throat of the tube. *Capsule* five-celled.

Specific Character.—Leaves egg-shaped, but ending in a sharp point, very shining; Corolla, tube three times the length of the calyx, bright crimson colour, terminating in greenish yellow, very shining, and hanging from the plant in a very graceful manner.

All the species of *Epacris* are natives of the neighbourhood of New South Wales, and are very handsome shrubby green-house plants. Their culture is very simple and easy; the *E. microphylla* and *exserta* require to be potted in about equal parts of light sandy loam and peat, but all the rest thrive best in sandy peat alone. They nearly all come into flower about the end of March or beginning of April, and continue blooming until June or July, although the present subject flowers most of the winter, as well as spring and summer.

In June they must be turned out of doors with the other green-house plants, but previous to which, it will be necessary to pot them, in most cases shifting them into larger pots; this is indispensable, as their roots are of so fine a texture, that if the pots be placed out of doors, and consequently exposed to the alternations of heat and cold more than when in the house, the roots against the sides of the pots will receive material injury, the plants will become brown, and in most cases die; this we have seen in very many instances.

The best way of propagating them is by cuttings, which should be put in early in the spring; they will strike if put in at other times of the year, but not so freely. Take off the extreme ends, about one inch or an inch and a half long, and plant them in pots of sand, cover them with bell-glasses, and give them a similar treatment to *Erica* cuttings; when they have struck root, pot them into small pots filled with sandy peat, and place the pots in a frame where there is a little heat; and when they have again begun to grow, remove them into a warm part of the green-house, and treat them in the same way as the old plants. The whole of the order



Epacris grandiflora

Epacrideæ, consisting of eighteen genera, all being natives of the same country, require the same general mode of culture, which may be stated as follows:—

1. With the exception of *Epacris microphylla* and *exserta*, *Styphelia longifolia*, the whole genera of *Lysinema*, *Ponceletia*, and *Leucopogon*, let every species be potted in sandy peat soil.

2. The above exceptions must always have an addition of sandy loam mixed with the peat in which they are potted, but in every other respect they must be treated like the other species.

3. Good drainage in every case must be attended to, for any deficiency here will seriously injure, if not totally destroy the plants.

4. Never sift the soil in which the plants are potted, but chop and break it well, although in some cases this is scarcely necessary, when the turfy parts are well rotted.

5. Never allow the soil to become hard and dry, particularly amongst those species potted in sandy peat alone; because, from the delicacy of the fibres of the roots, this cannot be the case without the plants being materially damaged, if not destroyed.

6. Always pot the plants immediately before they are turned out of doors in the summer; for if this be not done, the action of the sun and air upon the sides of the pot, if the roots are matted, will dry the roots, and the plant will become sickly and die.

7. In potting, never cut off the matted roots with a knife, but merely pull them with the fingers, without damaging the ball more than is necessary.

8. Always let the plants stand in an airy part of the green-house, and never crowd them amongst other plants, or they will not prosper.

9. In propagating, select half-ripened wood for cuttings, plant them in sand, cover them with a bell-glass, and place them in a shady part of the green-house, or in a frame; in both situations they must be shaded from the sun until they have struck root.

MIMULUS SMITHII.

MR. SMITH'S MONKEY FLOWER.

CLASS. DIDYNAMIA. ORDER. ANGIOSPERMIA.

NATURAL ORDER. SCROPHULARINEÆ.

Generic Character.—See page 29.

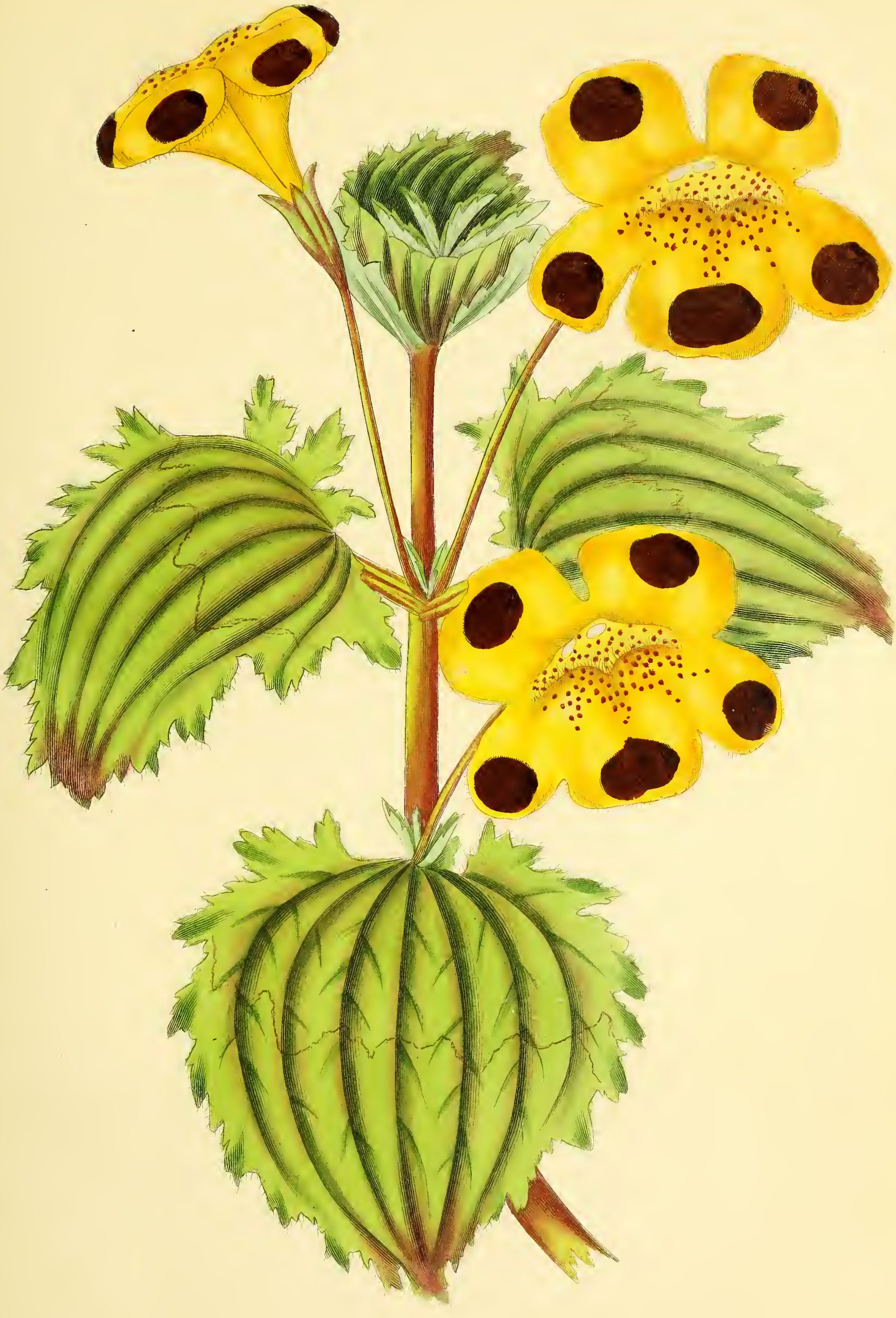
Specific Character.—Stem smooth. Leaves ovate, denticulate, and covered with white glandular hairs, each leaf having 7 smooth ribs. Calyx, teeth equal, sharp pointed, and bending somewhat backwards. Corolla about twice the length of the calyx. Stamens somewhat shorter than the tube of the corolla. Peduncules nearly thrice as long as the calyx.

This present subject, and the *Youngii*, which bear a very close resemblance to each other, are, without exception, the most beautiful plants of this genus known. It was our intention to have given this and the *variegatus* on one plate, but found it impracticable, without crowding and mutilating them both. The plant is a hybrid, raised probably between the *rivularis* and *variegatus*, but we are not acquainted with its history. It partakes much of the habit of the *rivularis*, and is a very profuse flowerer. It requires similar treatment to the *M. roseus*, p. 29, thriving the best in a light airy green-house. Our plants, just now come into bloom, will shortly be a perfect picture of flowers. The *variegatus* will probably be given in our next.

Our drawing was taken at the end of February, from a beautiful plant in flower, in our green-house at Chatsworth. We believe it has not been previously figured in any work.

Amongst those plants which possess peculiar irritability, or remarkable appendages, none are more interesting than the *Dionæa*, *Nepenthes*, *Sarracenia*, and others, which have the power of entrapping insects. Plants having this property may be divided into three sections—1st, Those which have hollow vessels or appendages attached to either their leaves or branches, containing a liquid, into which the insect having entered, is unable to return, as in *Sarracenia*, *Nepenthes*, *Cephalotus*, &c. 2nd, Those which entrap by their irritability, as *Dionæa*, &c.; and 3rd, Such as entrap by the viscosity of their stems, &c. as *Robinia*, *Silene*, and many others.

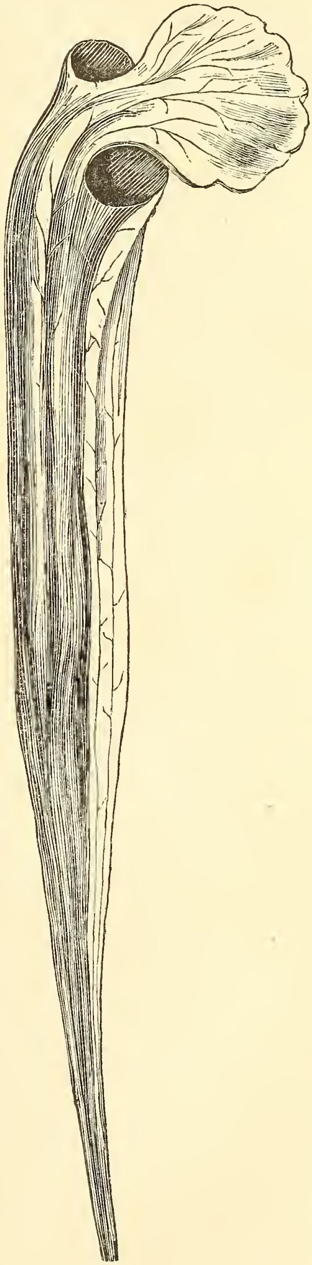
First. Such as have hollow vessels or appendages attached either to their leaves or branches. The remarks made by Mr. Murphy, in the Horticultural Register, vol. i. p. 214, are as follows:—" During my sojourn in the botanic garden of Trinity College, Dublin, where for some years I had the charge of the exotic plants, I took particular pleasure in availing myself of the excellent opportunity which I enjoyed, of subjecting to the test of experiment whatever I found recorded concerning the habits of the several plants; and especially with relation to the subject of this communication, being of opinion that much which is supposed to be known on this subject rests on little more than mere conjecture; and with a



Mimulus Smithii.

1834

view to direct the attention of others to the elucidation of an interesting inquiry, I shall take the liberty of submitting to you the result of the observations which I was enabled to make.



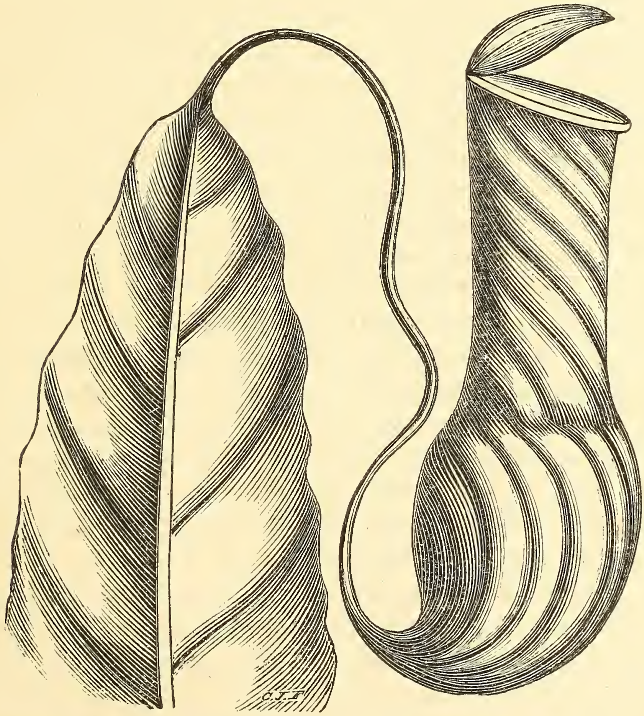
" And first, with respect to the side-saddle flower (*Sarracenia,*) a genus of plants with which most gardeners are acquainted. Each leaf is a hollow cylinder, capable of containing water: the aperture at the extremity of the tube is furnished with a leafy appendage, which before the leaf reaches its full size covers it so closely as to exclude the rain and dews; at other times the lid recedes from the aperture, and then the tube will generally be found to contain water, in which a number of dead and dying flies may at all times be observed. This singular construction of the leaf is evidently designed by nature to retain moisture, for the purpose of supplying the plant in times of drought; but the late Sir J. C. Smith, having probably examined the plant when young, and observing that the aperture of *S. adunca* (*variolaris*) was so completely closed as to exclude water, gave it as his opinion that the tube must have been intended to serve some other purpose; and having stated, on the authority of one of the young men in the Liverpool Botanic Garden, that the flies are deposited in the tubular leaves, by a species of sphex or ichneumon, concludes that ' The flies are deposited by this insect, unquestionably for the food of itself, or its progeny, probably depositing its eggs in their carcases, as others of the same tribe lay their eggs in various caterpillars, which they sometimes after bury in the ground.' I cannot avoid observing, that this quotation betrays greater inaccuracy in the late venerated president of the Linnæan Society, than one would have supposed compatible with the known industry of that close observer, and ardent lover of nature. We are not acquainted with any species of sphex or ichneumon which, in its perfect state, feeds on dead flies; and to place the fly in which the ichneumon had deposited its eggs in a situation where it must at once cease to exist, would be to frustrate the end designed in laying them, and is contrary to every thing that is known of the habits of these insects; for although the caterpillars often fall victims to these parasites, it is not until the latter have lived for some time, and have reached that stage of existence when they assume one of their metamorphoses."

A leaf of the *Sarracenia flava,* now before me, and from which the sketch was taken, contains no less than thirteen flies, principally the blue-bottle fly, (*Musca vomitoria,*) with two or three of the common house fly (*Musca domestica*). I have frequently observed the former of these species, after having penetrated some distance into the tube, struggling in vain to extricate itself; but no sooner had I enabled it to escape, than it flew off with its wonted strength and activity. Now, supposing it possible that any species of the sphex or ichneumon, which are occasionally observed in hot-houses, should possess the strength necessary to compel the common house fly to enter the tube, contrary to its inclination, it is far beyond the reach of probability to imagine that it could oblige the blue-bottle to do so; and however easy it may be for the ichneumon to deposit its eggs in the sluggish caterpillar, it could by no means deposit them in the body of this strong and restless insect. But, if the flies are not deposited in the tubes of this plant by these insects, what is it that induces them to enter? Possibly, as suggested in Kirby and Spence's "Introduction to Entomology," the effluvia emanating from putrid animalculæ, in the lower part of the tube, may induce the flies to enter in search of a fitting receptacle on which to deposit their eggs, or they may enter in quest of food; but whatever be their inducement, repeated observation has convinced me that their ingress is voluntary; and having descended some length, the gradual contraction of the tube, assisted by the short stiff hairs which clothe its inner surface, and which point downwards, effectually prevent their return.

These observations render it unnecessary for us to say much more relative to the *Sarracenia.* We might just add, however, that some pitchers which we examined the other day, on plants in our possession, contain flies of a large size, which must have crawled down of their own accord, since, from their position on the sides, not having reached the bottom, it was evident they were walking down, and could not have been violently thrown in by any other insect. We also saw a large wood-louse (*oniscus*) which had not reached the bottom. May not these have been allured by the sweetness found on the edge of the pitcher? particularly on that part of the *S. audunca?* This seems to have been the opinion of Macbride; the water, however, at bottom is often very offensive, which no doubt arises either from the putrid insects, or stagnation, or both, as we could not perceive any smell in those just opened, where no insects had made an entrance, and the water was fresh, nor had it any unpleasant taste.

CULTURE OF SARRACENIA.—The usual mode of culture practised at Chatsworth is to plant them in pots filled with turfy peat, mixed with small pieces of freestone to keep the soil very open; the pots are then plunged in sphagnum, or placed in pans of water. During the summer months they stand in a frame placed on a north border, and in winter we keep them in the green-house. *S. variolaris* has, however, grown luxuriantly in an airy corner of the stove, planted in sphagnum alone.

The goblet-shaped appendages attached to the leaves of the *Nepenthes distillatoria*, like so many organs of secretion, for it is plain the plant supplies the water they contain through the footstalks. These plants grow in China, and the marshes of India, in situations where they are partially submerged in water. Each pitcher has a curious lid, which is at first shut closely down; but as the pitcher grows in size, the lids gradually open, and they are then found to contain a considerable quantity of water, which has something of a sweetish, though rather insipid, taste. Within a few days after the lids open, the pitchers become the grave of a multitude of insects, chiefly flies, concerning which a variety of opinions have been entertained. The uses of the pitchers are scarcely known. Rumphius supposed they were intended as nests for a sort of shrimp frequently found therein. Linnæus thought they were reservoirs of water, to which animals might repair in time of drought, their lid being especially destined to close up the mouth of the vessel for the prevention of evaporation. Others suppose the putrid insects form a kind of animal manure which, passing through the footstalk of the leaf, nourishes the whole plant. It is difficult to determine what may be their use; but they can scarcely be

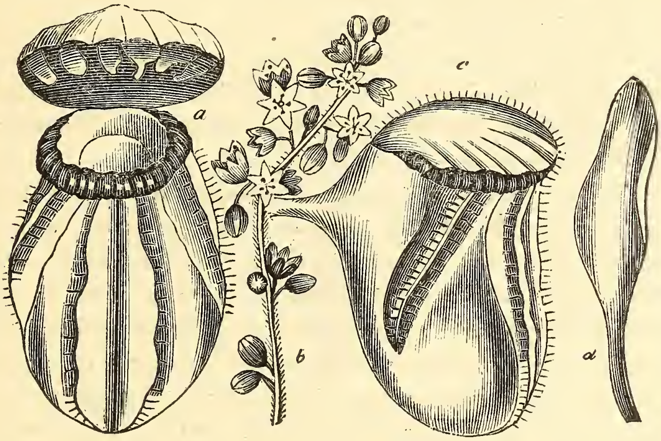


considered mere reservoirs of water for animals, since the plants invariably grow in swamps and ditches where such reservoirs would be useless. Besides, the lid never alters its position when once raised from the pitcher, and therefore does not prevent evaporation, the mouth being once opened. The water contained in the pitcher is, for the most part, evaporated within a few days after the opening of the lid, although there is evidently an increased secretion during the nights, yet never to any considerable quantity, at least not in our stoves. Professor L. C. Treviranus, of Breslaw, found that when the lid of *N. phyllamorphia* was open, the water diminished one half by solar evaporation, but it was restored again at night. In Ceylon, Mr. Campbell informs us that animals of the Simia tribe are well acquainted with this plant, and frequently resort to it to quench their thirst; still we can scarcely suppose this to be their destined use, for many other trees bear similar appendages, which could not be readily, if at all, emptied. Besides, the situation in which some of them grow, would render such a providential provision unnecessary. Whatever be their uses, there can be no doubt but they are necessary to the welfare and growth of the plant; for if one be inadvertently injured, the leaf to which it was attached becomes sickly, and for the most part is incapable of performing its natural functions.

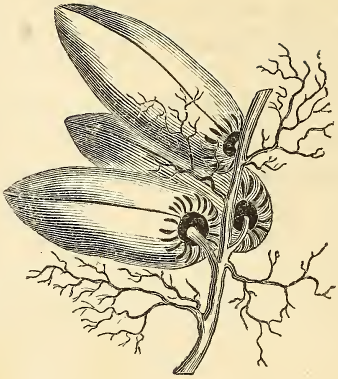
So great a quantity of spiral vessels was discovered by Mr. Valentine in the stem and petioles, that no plant has yet been noticed in which they are equally abundant. Now, Bischoff ascertained that the air conveyed by spiral vessels contains about 28 per cent. of oxygen; and, as an excessive supply of oxygen is destructive of vegetable life, it has been suggested that the pitchers are intended to rid the plant of its oxygen, and that the water they contain has been discharged by the spiral vessels themselves. An observation of the late Dr. Jack appears to favour this opinion; for on examining the pitchers, he found their bottoms beautifully punctured, as if by the mouths of vessels, the same we have noticed ourselves. Dr. Graham states, that the water contained in some of those which he examined at the Botanic Garden, Edinburgh, was at the first slightly acid, and that, as the water evaporated, the acidity increased, until the whole had passed off. Dr. Turner analysed the water from an unopened pitcher, and found it to contain minute crystals of super-oxalate of potash; and he says, that during the time of boiling, it emitted an odour like baked apples, from its containing a trace of vegetable matter. This may be considered as most of what is at present known of the uses of the appendages of *Nepenthes.*

Culture of the Nepenthes.—Slight shade, heat, and moisture, are indispensable for the successful culture of *Nepenthes.* They thrive best if potted in chopped moss: when they are potted, plunge them in a bed of moss, made on the flue of the stove, or other situation where they can receive a good portion of bottom heat, yet not too violent. In such a situation, they will thrive wonderfully, if the moss in which they are plunged be kept constantly moist, and the plants be syringed every day with tepid water, and the powerful rays of the sun be broken by the shadow of some other plants. One in a similar situation at Chatsworth is upwards of four feet high, and bears pitchers of a very large size.

The next plant in order is the *Cephalotus follicularis*, or New Holland Pitcher Plant. The root is a perennial belonging to the natural order *Rosaceæ* according to Dr. Hooker, although Dr. Lindley places it doubtfully under *Sanguisorbeæ*, in his "Introduction to the Natural System." This plant is remarkable for the presence of flat leaves (*d*) of an elliptical form amongst the pitchers (*a, e*). The form of these last are ovate, of a green colour, tinged with purple, and beautifully fringed with hairs. The inside, which contains a sweetish watery fluid, and entraps many insects, especially ants, is dark purple. The mouth is contracted, and crested with rings of dark purple. In regard to the organisation and position of its pitchers, the plant may be compared to *Sarracenia*. M. Labillardiere discovered it in Leuin's Land, and figured and described it in his specimens of the plants of New Holland. Mr. Browne, during his voyage with Captain Flinders, detected it on nearly the same line of coast, viz. in the neighbourhood of King George's Sound.



Not being in possession of this plant, we are unable to speak from experience, and have copied from Dr. Hooker, in the Botanical Magazine, what is stated above, in which work it is beautifully figured, fol. 3119. Several trees and climbing plants have similar appendages attached to the leaves, but are entirely destitute of the lid. For instance, in the species of *Dischidia*, which are climbing plants, the pitchers are in the form of bags of a greenish colour, and hang in bunches from

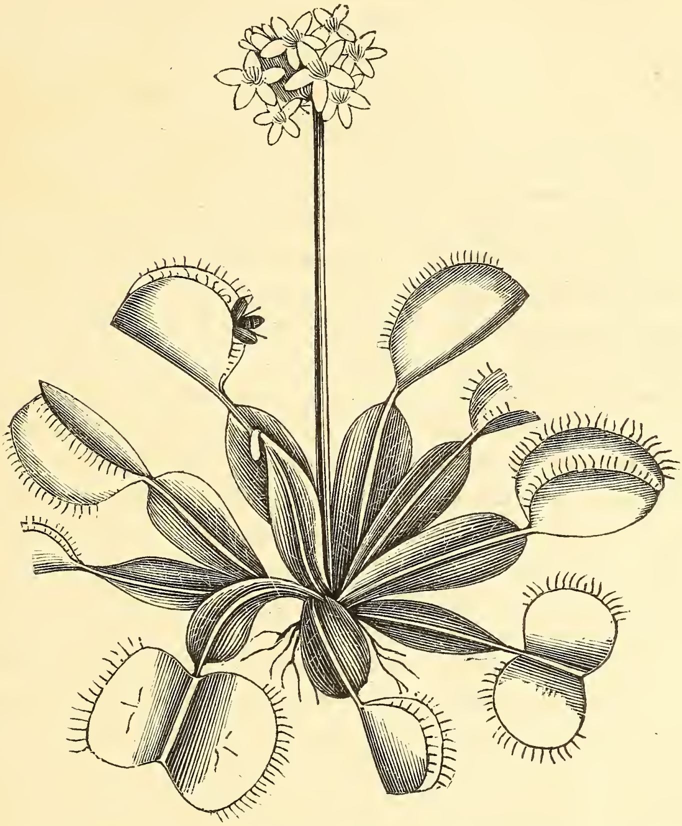


the slender stems; and the use of them, as Dr. Wallich remarks, is probably "to form reservoirs of nutriment from which the roots emitted by the stem, and constantly found ramifying within them, absorb food for the general support of the individual. In this case they are necessary, on account of their long, slender, twining stems being too narrow a channel of supply from the subterranean roots to the leaves."

The *Macgraavia* also have little pitchers occupying the place of bracteæ, which either hang down or stand erect among the flowers but, together with the last, are very differently constructed from the *Nepenthes* and *Sarracenia.* Amongst these hollow-leaved plants, may be placed the *Dipsacus fullonum,* which forms at the axillæ of the leaves a kind of basin, usually containing a quantity of water, which becomes the grave of a multitude of insects. The water had once the reputation of being a beautifier of the skin, but is now little regarded.

The preceding remarks are chiefly confined to some of the plants having peculiar appendages, attached either to their leaves or some other part of the plants, into which, being hollow and containing a liquid, insects of different kinds are, from some unknown motive, induced to enter, and from which, on account of certain impediments, they are totally unable to escape; consequently, the hollow appendage becomes their grave: but whether their death is necessary to the well-being of the plant cannot be decided, and, therefore, the question must be for the most part left as we found it.

The next plants in order are those which have the power of entrapping insects by the contractility or irritability existing either in the leaf or flower. Amongst those possessing irritability in their leaves, none are more remarkable than the *Dionæa Muscipula,* or Venus's Fly-trap. This plant has jointed leaves, furnished on the edges with a row of strong prickles, and what is usually called the leaf is supposed by some to be the petiole, which is winged like that of the orange, so that it is the proper leaf which operates as the trap. Others, however, have thought that the winged petiole, or leaf-stalk, is the true leaf itself, and that the trap is merely an appendage; this latter opinion, from the appearance of the plant in our possession, strikes us as being the most probable. There is a sweetness secreted in glands on the surface of the trap, which appears to attract flies; and no sooner do they venture to settle on its surface, than the sides of the leaves spring up after the manner of a rat-trap, and locking their rows of prickles together, squeeze the insects to death; after which it again expands. Linnæus and others thought, that if the insect ceased to struggle, the leaf would open and liberate the prisoner. This might possibly be the case, if it were perfectly quiet, but the least irritation keeps it fast closed. Ellis says the lobes never open again, so long as the animal continues therein; that is, so long as it remains a perfect insect, or, in other words, until it becomes a skeleton. However correct this idea may be in some instances, it does not appear to hold good in all; for some plants of the kind in our possession begin to open soon after the little insect's death, and in the course of a short time the plant is expanded as it was before. A straw or a pin touching the middle of each lobe has the same effect as the legs of an insect, for the chief seat of irritability appears to be in three small hairs situated in the middle of each lobe; but after these are withdrawn, the lobes will again open in the course of an hour. What can be the use of this extraordinary irritability is not at present discovered. Sir J. E. Smith believed that the dead insects were beneficial to vegetation, and this opinion so far influenced Mr. Knight, of the King's-road, London, that he supplied the leaves of a plant with fine filaments of beef, and from that treatment it grew more luxuriant than some others in his possession, which



were not treated after that manner. This experiment goes far towards confirming the opinion that the dead insects are intended to supply the plant with animal manure. Dr. Barton, however, does not think it at all probable that either this plant, or others which grow in rich boggy soil, can need additional stimulus. There is no doubt some wise end is answered by so extraordinary an appendage. The plant grows naturally in the bogs of Carolina; the flowers are white, and grow in corymbs, resembling umbels. There are also several species of Sundew (*Drosera*), which exhibit a similar phenomenon in the leaves. Those near the root are covered with long red bristles or hairs, bedewed with a sticky juice, possibly of a poisonous quality, especially destructive to insect life. If a fly settles on the upper surface of the leaf, it is first detained by the clammy liquid; and then every hair turns inwards, towards and over the insect, and remains curled, not only till the prisoner is dead, but until he is entirely consumed. The disc, which before was contracted and cone-like, then expands to its fullest breadth, and the hairs again become erect. It has, however, been thought that its fly-catching powers only consist in the viscosity of the leaves and hairs, and that any movement in the latter may be accounted for on the hypothesis, that by the motion of the hairs, or any part of the leaf, others may come in contact with and adhere to them. Hence an insect touching the leaf would find no possibility of escape, for amidst these globules of slimy liquid, every struggle would but render its extrication more impossible. Scientific men are equally at a loss to account for the use of the fly-catching properties of this plant, as they are with regard to others. Some have thought it to act merely in accordance with the law by which one thing preys upon another, so that nothing may become too abundant; and thus the *drosera* is made an instrument of destruction, useless to itself, but subservient to the general good. There is something peculiar in the time and manner of the flowering of this genus, for few of the species are ever observed with their flowers expanded; and some persons have concluded that they either never properly expand, or that their expansion takes place at sunrise, and they quickly close again, or that it occurs at night. The fact is, they open about ten o'clock in the morning, and generally are closing about twelve. The usual flowering time is July, when they may be found in most of our marshes; the leaves have a very novel appearance under a microscope; their loose cellular tissue glistening like gold, the fine long scarlet hair, tipped with a crimson knob, from which there exudes a clear white liquid, which, on being touched with the finger, will draw out into a transparent thread more than an inch long, are all seen to very great advantage. Their medicinal properties appear to be very trifling; for the most part they are acrid and poisonous. Sometimes the irritability wholly resides in the flower; this is the case with the common *Barberry-bush.* The manner in which the stamens are spread out renders them incapable, without some assistance, of casting their pollen on the head of the stigma. When an insect enters the flower in search of honey, and its legs or body touch the inner part of each filament near the bottom, which it cannot well avoid, the filaments immediately contract; each of them bending over, strikes its head against the top of the stigma, where it deposits the pollen, and by this means imprisons the insect. Its confinement, however, is seldom of long continuance, for, after a time, some degree of exhaustion appears to take place, and the stamens become partially flaccid, of which circumstance the insect generally takes advantage and makes its escape. After this the stamens fall back to their usual situation, and shortly recover their irritability, which continues not merely whilst the anthers are discharging their pollen, but extends more or less beyond even the falling of the corolla. No remarkable movement of the stamina takes place, on touching them in any other part than the inner near the bottom. The stamens of *Opuntia Tuna*, a South American plant, introduced in 1731, is endued with a similar irritability, but the stamens do not form so compact a prison as *Berberis.* Another plant, the produce of our British woods, presents also a very curious structure—the *Aristolochia clematitis;* of this plant, which is so curiously formed, Professor Willdenow asserts that the anthers, of themselves, cannot impregnate the stigma. The throat of the flower is lined with thick hair or bristles, pointing downwards, so as to form a funnel similar to the entrance into a wire mouse-trap. The insects may very easily walk in, but are totally unable to return, in consequence of the points of the hairs meeting them. It sometimes happens that several enter into one flower, where, their confinement becoming irksome, they keep constantly moving about, and thus stimulating the filaments, the anthers deposit the pollen upon the stigma; but, after impregnation is performed, the hair shrinks, becomes flaccid, hangs down close by the sides of the flower, and the little prisoners then leave their cage. The insect that frequents this plant is a species of gnat (*Cecidomia*), although a writer in the Annual Medical Review doubted the accuracy of the fact; but it has since been proved, by ocular demonstration, the flowers inclosing the very insects having been sent several miles.

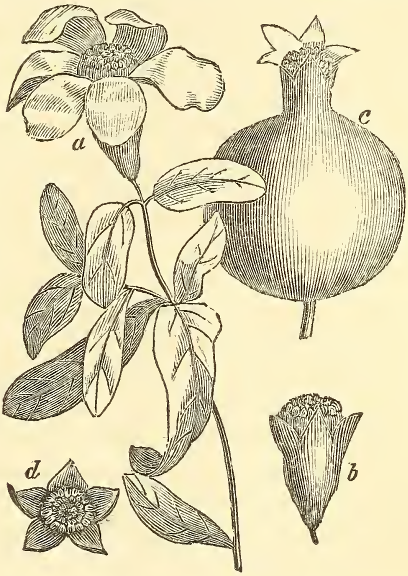
CULTURE OF POMEGRANATES.

The generic name, *Punica,* of this tribe of plants, seems to have arisen from the circumstance of the *P. granatum* being found growing in that part of Africa where ancient Carthage stood; the ancients called the fruit *Malum Punicum,* Carthaginian Apple; and *Pomum granatum,* Kernelled Apple. The specific name *granatum,* from *granum,* grain, on account of the grains of its fruit, was borrowed from the latter. The Grecians seem to have set very great store by this fruit. The tree was first brought to Rome from Carthage in the days of Sylla; and Pliny informs us, that the colour to dye cloth, called *Punicius,* is obtained from the flowers, and that the Romans used the rind, flowers, and every part of the fruit in medicine. Sloane says, " The rind of the fruit, together with the bark of the tree, is still used in some parts of Germany, in the dying and preparation of red leather." The rind also produces as good ink as that made from galls. In its wild state it grows to a bush from sixteen to eighteen feet high, and bears profuse crops of fruit, something after the manner of our hawthorn. Wine made from this fruit, was strongly recommended by Lord Bacon for complaints of the liver; or, if the wine could not be had, newly expressed juice might be used. He says, " Let it be taken in the morning with a little sugar; and into the glass in which the expression is made put a small piece of green citron-peel, and three or four whole cloves: let this be taken from February to the end of March." The Persians make a very favourite drink of the rind, with the addition of cinnamon. The *P. nana* is used as a hedge plant in the West Indies; its leaves are diminutive, and its red flowers, although not large, are pretty conspicuous. The common Pomegranate, *P. granatum,* was first cultivated in England in the year 1548, during the reign of Henry VIII. Trained against a south wall, its fine scarlet flowers have a most beautiful appearance throughout all the summer months: the fruit, however, produced in such situations, although highly ornamental, seldom has any flavour, or comes properly to perfection.

Propagation and Culture.—The usual mode of propagation is by layers. Lay down the branches of the previous year's growth in May, merely pegging them without making any incision; and by the autumn they will have made good roots, and may be taken off any time before the buds break, and planted either in thirty-two sized pots, in a mixture of good rich loam and a small portion of sandy peat, or against a warm wall, as recommended hereafter. They will also strike freely by well ripened cuttings, taken off in the autumn, and planted in pots filled with equal quantities of light sandy loam and peat, covered over with a hand or bell-glass, and set in a shady part of the green-house or stove, keeping them perfectly free from mould, or over dampness, until the following February, when they should be plunged in a bark or hot-bed, where they will speedily strike root; they should then be potted off separately, and again plunged in a brisk heat, until they have established themselves: they may then be gradually hardened, until they will bear the temperature of the green-house, carefully repotting when required. The second year after they are struck they may be turned out, under a south wall, in front of a stove or green-house. Where they are intended to be planted, take out the soil to about the depth of twelve inches, and lay at the bottom about three inches thick of broken bricks, or other hard rubble, to prevent the roots from striking deep, and induce them to run near the surface, for if once they get deep, however suitable the soil may be for their growth, they will flower but very partially. Fill up the trench with a good strong rich loam, mixed with a small portion of sand, if it is inclined to bind. Some persons recommend a light sandy soil to grow them in: some years ago I tried the experiment, and although the plants grew very healthy and vigorous, they did not show the least inclination to flower.

Pruning.—Proper pruning will greatly assist their flowering. All the flowers are produced at the extremities of the young branches formed the same year, care should therefore be taken to bring only the strongest buds into action, instead of filling the tree very full of weak shoots: to accomplish this, cut out all the weak branches of the former year, and shorten the others according to their strength; by these means a quantity of flowering wood may be obtained throughout the whole tree.

Grafting.—The yellow, white, and double scarlet varieties are often grafted on stocks of the common one: the operation is performed in February or March, after the same manner as the apple, &c. To bring the fruit to perfection, it is indispensable that the trees either be trained against a flued wall, or covered with a glass-case; for although there have been instances of their ripening on a common wall, in some parts of England, yet the flavour has little or no resemblance to those imported from Genoa and Leghorn; and although I have never yet seen them brought to the perfection I could wish, yet the method which appears to me most likely to accomplish the object, is to keep the plants in pots or tubs; and when a quantity of fruit is set, which will probably be about the middle of August, introduce them into a higher temperature to swell up and ripen.



a, the flower; *b*, the calyx and stamens; *d*, another view of the same, showing the attachment of the stamens to the calyx; *c*, the fruit.

CULTURE OF BIENNIALS.

Biennial flowers are divided into four sorts—viz., hardy, frame, greenhouse, and stove plants. Their lives generally terminate at the end of the second year, when allowed to flower and seed; but most, if not all of them, will live for three, or even four years, if the flowers be nipped off as soon as they appear, and the plants be preserved from injury. The hardy species, as *Erythræa aggregata, Hedysarum coronarium, Centrocarpha triloba, Eutoca multiflora,* &c., may be either sown in the open borders, or in some compartment set apart for the purpose. They will thrive best in a light sandy soil, or with a portion of peat mixed with it; yet the *Eutoca multiflora, Hedysarum coronarium, Centrocarpha triloba, Echium violaceum,* &c. will succeed in any common soil. The season for sowing the seed depends in some measure upon the time the plants ripen it. Those plants which flower early, and ripen their seed by August, as *Eutoca multiflora, E. Franklini,* and *Erythræa aggregata,* should be sown as early as convenient after being gathered; whilst those which do not ripen till September or October, as *Hedysarum coronarium, Dianthus Chinensis,* &c. must not be sown till the following May. Sow them thinly in shallow drills, and cover the seeds with soil broken fine. When two or three inches high, transplant them into other beds, and when grown a good size, take them up with balls, and place them in their final destination. Some sorts grow with large tap roots, and, from the great care requisite in removing these without injury, it is advisable to transplant them from the seed bed into small pots, and afterwards to turn them out with the balls entire.

Treatment of Frame Biennials.—Although this division of biennials, including *Ipomopsis elegans, Salpiglossis Barclayana, S. atropurpurea, Verbena pulchella,* &c. are not so hardy as the last, they will do well in the borders during summer. They require to be raised on a slight hot-bed, in the same manner as half-hardy annuals, page 19. The soil in which they are sown must be light and sandy, and the best time to sow them is the beginning of April. At the end of May, transplant them either into the open borders or pots, and it is always well to have a quantity of the latter, for, should the summer prove wet, the *Ipomopsis elegans, Salpiglossis, Barclayana,* and several others of delicate textures, are liable to perish. It is not unusual for the varieties of *Salpiglossis,* &c. to flower the same year they are sown, but they flower much finer when preserved till the following spring, by picking off the flower-buds as they appear. During winter, the roots will require protection from the frost, either by means of a flower-pot filled with litter, or by potting them and setting them in a pit or frame. In all other respects, their treatment resembles hardy biennials.

Greenhouse Biennials.—These may either be sown on a hot-bed, as recommended in the last case, or be sown in pots, in the same manner as tender annuals, page 20. Indeed their general treatment may be the same as tender annuals. They will require potting in a mixture of sandy loam, peat, and leaf-mould. Although naturally biennial, many of these plants may be perpetuated for a number of years, by constantly raising them from cuttings, as the *Anagallis latifolia,* and other species which root immediately when planted under a hand-glass. Others may be propagated by division of the root, as *Arctotis argentea, Ancilema nudiflora, &c.* Others, such as *Anchusa capensis, Humea elegans, Cynoglossum pictum, Manulea cheiranthus,* &c. can only be propagated by seeds, which will, in general, ripen pretty freely.

Stove Biennials.—These require similar treatment to stove annuals (page 20) until they arrive at maturity. They may then be mixed among the other stove plants, and either be plunged in bark or otherwise, as may be found necessary.

SELECTION OF CHOICE BIENNIALS.

HARDY.	ft.	in.
Scarlet.		
Erythræa aggregrata	0	3
Hedysarum coronarium	4	0
Yellow		
Centrocarpha triloba	4	0
Purple.		
Eutoca multiflora	1	6
— Franklini	1	0
Blue.		
Echium violaceum	3	0
FRAME, OR HALF HARDY.		
Scarlet.		
Ipomopsis elegans	2	0
Dianthus Chinensis	1	0
Purple.		
Verbena pulchella	1	0
Salpiglossis atropurpurea	1	6
Yellow.		
Salpiglossis Barclayana	3	0
TENDER, OR GREENHOUSE.		
Blue.		
Ancilema nudiflora	0	6
Anchusa Capensis	1	0
Cynoglossum pictum	1	0
Scarlet.		
Humea elegans	6	0
Purple.		
Anagallis latifolia	1	0
Orange.		
Manulea cheiranthus	1	0
Arctotis argentea	1	0
— fatuosa	2	0

CULTURE OF THE GENUS DIANTHUS.

Almost all the species of this genus are held in great estimation, some for their peculiar beauty, and others for the delightful fragrance they emit. The annual species and varieties, as *corymbosus, armeria,* &c. require only to be sown as other annuals in the open border. The perennial herbaceous species differ very little as to their mode of treatment.

The Dianthus Barbatus, or Sweet William, is an old and well-known inhabitant of our gardens, and was much esteemed many years ago. The seed should be sown in May, with the other biennials. Prepare a bed of light earth, sufficiently large to hold the number of plants required; sow the seed, and cover it lightly, keeping it clear from weeds during the summer; early in August they may be removed, and planted in the places where they are intended to flower, or, if it is not convenient to remove them in August, they may remain in the seedling bed until the arrangements are made in the spring.

This treatment will answer for all the species and varieties of similar habits to the Sweet William, as *aggregatus, latifolius,* &c. The *dianthus hybridus,* or mule Pink, so well known and much prized in our gardens, is probably a variety betwixt Poiret's Pink, and the common garden Pink, or betwixt the former and the Carnation. It requires the same treatment as the common Pink, which will be treated on hereafter; the culture of which, together with the Carnation and the Sweet William, may be taken as standards for the whole genus.

Culture of the Carnation. This is a plant of much value amongst florists. It appears to have been totally unknown to the ancients, in its cultivated state, although it has from time immemorial been a favourite flower in Europe: Gerard, in 1597, received it from Poland. It has been occasionally found in a wild state, in England, growing on rocks and walls: the generally received opinion, however, is, that it is a native of Germany and Italy, where it is much cultivated. In the beginning of the seventeenth century, there seems to have been about fifty good sorts known; and the most popular cultivator, at that time, was a florist of the name of Tugge, who lived in Westminster. Early in the eighteenth century, as many as 350 or 360 valuable sorts were cultivated, which appear to almost equal our catalogues of the present day. Hogg, in his Treatise, published in 1820, enumerates the same quantity of sorts then in his possession. About the beginning of the last century, the first Florists' Society was formed, and shortly after several more, which awarded prizes to successful competitors, and which at once accounts for so large an assortment of Carnations at that time.

The florists of the present day divide the Carnation into the following classes :—

1. Bizarres, (from the French, signifying irregular, odd,) which consist of those whose flowers are striped with irregular spots and stripes, having two colours on a white ground.

2. Flakes. Such as have only one colour on a white ground, being in large stripes going quite through the petals.

3. Picotees. Such as have a fringed edge, usually a white ground, spotted or pounced with scarlet, red, purple, or other colours.

The following are considered by florists the requisite properties of a good Carnation :—

1. The flower stem should be straight and strong, growing not less than thirty inches high, nor more than forty-five.

2. The flower should not be less than three inches in diameter, and should be supported by the stem without drooping.

3. The calyx should be strong, about an inch long, firm enough at the top to keep the base of the petals in a circular body, rising about half an inch above the calyx.

4. The petals should be long, broad, and stiff, easy to expand, and make free flowers; the outer circle of petals, turning off gracefully, in a horizontal direction, and substantial enough to ably support the interior petals, which should decrease in size as they approach the centre, and with them the centre should be well filled up; they should lie over each other in such a manner as that their beauties can meet the eye at once; their edges should be perfectly entire, without either notch, fringe, or indenture; and of whatever colours the flowers may be composed, they should be perfectly distinct.

5. The centre of the flower should not rise too high above the other parts; but the whole flower should be somewhat flat and even, and perfectly round at the outside.

6. Each petal should have a due proportion of white, which should be perfectly pure and free from blemishes or spots ;—of Bizarres, somewhat less than one-half; Flakes, about one-half; and Picotees, a little more than one-half.

These flowers are usually propagated by layers, but they will also grow by pipings; and new varieties are raised from seed.

As very double flowers seldom produce seeds, they are not to be depended upon for it; but in selecting plants for the purpose, always—

1. Choose such plants as possess the very best properties in every other respect except being double; that is, let the colours be clear and vivid, the petals strong, and well placed, and in every other respect answering to the above description.

2. When these plants are selected, separate them from the rest, and place their pots upon a stage, in any open situation in the garden, sheltering the flowers from rains, by the covers hereafter described.

3. Give them a regular supply of water, until the seed is perfectly ripe, which will take place in August, which will be known by the seed-vessels becoming brown, and the seeds nearly black. This must be particularly attended to, for if gathered too soon, by far the greater part will be unproductive.

4. It is always the best to carefully draw out the withered petals as soon as they become dry, because they are liable to cause mouldiness, by retaining a certain portion of moisture.

5. When the seed is gathered, allow it to remain in the capsule until the middle of the following May, for it keeps much better in this way than when shaken out into paper.

6. *Sowing Seed.*—Fill some pots or pans with the compost in which the plants are recommended to be potted, precisely on the same system as that recommended for Auriculas, page 10; lay a little fine sifted soil over them, just sufficient to cover the seed; place the pans in an airy part of the garden, keep the soil moderately moist, and shade them from the heat of the sun and dashing rains.

7. When the seedling plants are three inches high, and have six leaves, plant them out on a bed of rich mould, composed of good loam and rotten dung, equal parts. Plant them in rows, about ten inches apart in the row, and twelve inches from row to row.

8. When planted out, fix a quantity of hoops over the bed, and by means of mats, or other similar covering, shelter them from the effects of rains and frosts. By these means they will usually flower the following summer.

9. *Soil.*—Some distinction should be made in the soil for the strong and high-coloured carnations, which usually do not require a soil quite so strong and rich as the more delicate ones. Therefore, for the strong and high-coloured bizarres and picotees, take two barrowsful of light rich maiden loam, and one barrowful of well rotted dung from a cucumber bed, and half a barrowful of river sand. For the rose and purple flakes and delicate picotees, take two barrowsful of good rich loam and two barrowsful, at least, of well rotted dung, and half a barrowful of river sand; mix and chop these well together in the autumn, and turn the compost two or three times during winter, but never pot in sifted soil.

10. All the very choice kinds must, to have success, be grown in pots. The best sized pots for the purpose are twelve inches deep and ten inches wide at top, with a good sized hole at the bottom, and three or four small holes round the sides

at the bottom, to facilitate the escape of the water and prevent the danger of stagnation.

11. The most proper time for potting is the middle of March: never defer it much longer or the plants will not flower freely. Potting is done in the common way, placing three in each pot.

12. Be careful that the plants be placed no deeper in the pots than they were in those they previously occupied.

13. After being potted, place them in an open airy part of the garden, and form an arch of hoops over them to preserve them from cold winds, dashing rains, and frosty nights. But when the weather is fine they must be constantly exposed.

14. Water them regularly, in this situation, with soft water, from a fine rose watering-pot.

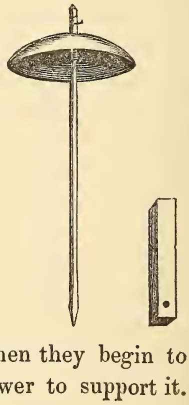
15. When the flower-stems are grown eight or ten inches high, tie them to neat sticks, for, being very brittle, they are liable to be broken by the wind. When the stems are about sixteen or eighteen inches high, remove the pots to the situation where they are intended to flower.

16. The stage on which they are placed for flowering should be composed of boards, raised about a foot from the ground, broad enough to hold either a single or double row of pots, according to the option of the cultivator; over this stage an awning must be raised, so that in case of rain the plants may be protected, or the colours will run and the beauty of the flowers spoiled.

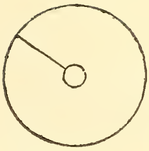
17. When the buds are all formed, thin out all the small ones, never leaving more than ten nor less than four to flower; and let these be the finest and most promising buds.

18. To prevent the buds bursting on one side, which is apt to be the case with many sorts, by which means the compact and graceful form of the flower is destroyed, tie a little bit of thread round the middle of the calyx, or a small narrow slip of bladder which may be long enough to lap over and be fastened with a little gum-water; also, with a sharp penknife, in some cases, cut the calyx equally on every side, but this last system is apt to give a looseness to the flower, which partially destroys its beauty.

19. When the flowers begin to open, they must be sheltered from the sun by means of strong paper covers, as the figure: these must be about twelve inches diameter, painted white or green, and formed like an umbrella, to throw off the rain; each should have a square tin tube at the top that would allow the stick to which the stem is tied to pass through as far as is necessary. This tube should be about two inches long, and have a small hole bored through one of its sides, like the figure, that it may be fixed by a nail to any part of the stick required. When, however, a great many flowers advance into bloom, it is better to cover them with an awning.



20. In the beginning of August they will be in full flower; when they begin to expand, a collar must be placed round the bottom of the flower to support it.



" These collars are made of white card paper, in the form of a circle, of three or four inches in diameter, with a hole in the centre, just large enough to admit the calyx, or pod, without much compressing it, and with a cut extending from the centre to the outside or circumference, like the radius of a circle: on these the petals are finely disposed, and the beauty of the carnation displayed to great advantage."

21. In the month of June, give the plants a top-dressing of leaf mould and sheep-dung, which will give them a very healthy appearance, and enable them to grow much stronger, and give a greater richness and brilliancy of colour to the flowers.

22. Carnations are very apt to die off when they are just ready to flower; this is occasioned by growing them too strong during the winter season: for when the soil is very rich in which they are grown during winter, they make a very large quantity of roots, become strong, and throw up flowering stems. These luxuriant stems being pithy, the sap cannot properly circulate; this causes the plants to appear sickly, wearing a whitish hue, and when nearly coming into bloom they usually die, as though it was for want of water, which sometimes is injudiciously administered as a remedy. If the flowers are grown for competition this sudden loss cannot altogether be avoided, for the rich soil gives a far greater brilliancy of colour: yet some usually run and become almost one colour, and others die. The best way is, therefore, to pot or plant some in rather poorer soil, which will flourish, and do to perpetuate the sorts by, and the others will show the brilliancy of the flowers.

23. The high coloured varieties being most subject to run in the colours, none of them should ever be potted in too rich a soil.

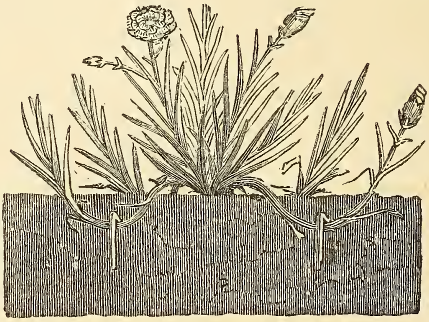
24. When it is thought well to plant them out in a bed instead of pots, make the soil moderately rich, and trample it rather solid, after the manner of making an onion bed; this is found in a great measure to prevent their dying off just before flowering, because it partially checks their luxuriant growth.

25. Those who are curious usually take out carefully all petals that are not of a true colour, and if the remaining petals are carefully disposed, the loss will not be discovered.

26. As soon as the flowers have turned the height of their perfection, the plants should be layered; if done sooner, the bloom will be greatly impaired in consequence of the check given to the sap, by the operation of tongueing.

27. Prepare a quantity of hooked pegs, and light soil composed of sandy loam and leaf mould. Prepare the layers by cutting off their lower leaves; next stir up the old earth in the pots and fill up with the above soil not sifted; then make an incision with a sharp penknife by entering about a quarter of an inch below a joint, and passing the blade of the knife up through the centre of it, and continue to one half or three quarters of an inch above it. The portion of the stem left below the bottom of the joint must be cut off horizontally close to the joint, and this part of the operation is completed.

The incision being thus made, the layer must be gently pressed into the mould and secured by one of the pegs, not less than half an inch, nor more than an inch, below the surface, and raise the extreme point of each as upright as possible; water and shade, as the weather may render it necessary, and they will have struck root in three weeks, and be ready to pot off in six weeks. This slit or tongue recommended to be made is requisite, to interrupt the downward flow of the pulp, so as to cause it to form root fibres, while the upward flow of sap in the more central parts not being interrupted, the layered branch continues to grow as if it had not been so treated.



28. When the layers have struck root, cut them off from the parent plants, with about an inch of the stalk below the incision attached to them, and plant in forty-eight sized pots, filled with good loam and leaf mould: a single plant in each, if the plants are strong; if small, two or even three may be planted in each pot, placing them round the sides.

29. When potted, place them under an arch of hoops in an open airy part of the garden; in this situation shelter them, by means of mats, from heavy dashing rains and cold winds till winter.

30. About the middle of October prepare a frame for the reception of the plants. In the first place, set it in a warm situation opposite the south, and fully exposed to the sun: raise it from the ground by laying a brick under each of the front corners, and two bricks under each of the back ones—this will give a good bevel towards the sun: then proceed to place all round the outsides of the frame not less than a foot thick of soil, well trodden down, and raised nearly as high as the top of the frame. Next prepare the floor on which the plants are to be placed, first, by laying a good floor of lime scraps, and on the top of that, about six inches of coal ashes, on which the plants are to stand. This floor will effectually prevent worms from penetrating, and also add much to the warmth and cleanliness of the plants. Elevating the frame, also, is far preferable to setting it on the ground, as it is not so liable to rot, and the more the plants are raised above the level of the surrounding earth, by a thick floor of ashes, &c., the more easily will they be kept from damp.

31. The frame being thus prepared, remove the plants from the arched hoops and place them on the floor of ashes, covering them with glasses in rainy or frosty weather. *Carnations* require very similar treatment in winter to that recommended for *Auriculas,* page 10, rules 4 and 5. They will bear a strong frost, if dry, without receiving material injury; but if the plants are wet, they usually suffer.

32. Great care must be taken not to shut them up too close if the plants are wet, or they are very apt to become infested with the mildew. When this is perceived, cut off the infected parts, or remove the diseased plants altogether from amongst the others, for the disease will rapidly spread.

33. In consequence of wet and hazy weather, the soil in the pots will become

green with moss on the top; when this is the case, stir up the soil carefully about half an inch deep, and sprinkle a little coarse sand upon it. This operation should be performed as often as is requisite.

34. Propagating *carnations* by pipings is not to be depended upon, although some sorts grow well, yet rarely more than one half of the pipings that are put in ever strike root; but where the shoots are not long enough for laying, or are broken off by accident, piping is very necessary.

35. Prepare a slight hot-bed in an eastern or western aspect, and as soon as the heat is moderate, lay on about six inches' thickness of light mould, sifted finely.

36. No piping should have less than two or three complete joints. Take off the cuttings horizontally just below the second or third joint, and merely cut off the leaves from the joint that is to be inserted into the soil, but leave the upper ones entire, both in pipings and layers.

37. After giving the earth of the bed a moderate watering, place on a hand or bell-glass to mark the boundaries in which the pipings are to be planted.

38. Plant the pipings not more than an inch distant from each other, and half an inch deep; give them a gentle watering, to fix the soil closely about them, let them remain uncovered until the leaves are dry, then place on the glasses and press them gently down to prevent the admission of air.

39. Give the cuttings a little morning sun, but always shade them when the heat becomes strong, which may be done by covering the glasses with mats.

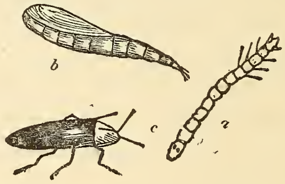
40. It is necessary after the first week that the glasses be occasionally taken off to admit air to the pipings; but this must never be done when the sun is powerful, but either in cloudy weather or early in the morning.

41. When the pipings are watered, never place the glasses over them again until the leaves are dry, and then not without first drying the glasses, or mildew will be the consequence; and this must be continued until the pipings are well rooted, which will be in about six weeks, when the glasses may be removed altogether.

42. When rooted, plant them in 48-sized pots, as recommended for layers, and place them in a frame for a while till they have made fresh roots, then expose them by degrees, and treat them like layers.

43. Many insects are troublesome to this plant, as the aphis, or green fly, earwig, wireworm, grub, snail, and slug; also a very small black insect which eats the colour off the petals. The earwig is the most dangerous, because it commonly secrets itself in the calyx, and bites off the petals at the lower ends, or claws, thereby causing them to fall out, and greatly disfigure the flower; so that if any of the petals hang loose, or fall out, you may be certain that an earwig has been, or is still, there. The best remedy is to get a large saucer or feeder, and place a brick in the centre, and fill up the saucer with water: if the pot is then placed on the brick, neither earwig, snail, nor slug, will venture across. Also, set traps for them by placing tobacco-pipe heads on the tops of sticks, and by examining them every morning, the number of depredators will soon be lessened. The aphis, or green fly, may be destroyed by using weak tobacco water, or sprinkling a small portion of Scotch snuff upon the infested parts early in the morning, whilst the dew is upon their leaves.

The well known wire worms we believe are the larvæ of two species of click beetles, the Hemirhipus lineatus and obscurus: we never had an opportunity of knowing, from practical observation, but they are stated to continue in the larvæ state for five years, during which time they feed on the roots of various plants. They are exceedingly destructive in newly made gardens, for several years taking off almost every crop both of flowers and vegetables. Many means have been adopted to eradicate them, some of which have proved successful. The best way appears to be that of alluring them by baits of different kinds. This was first suggested by Sir Joseph Banks, and has now become pretty generally adopted; the plan is this:—Where the insects abound, bury at about an inch under the surface of the soil slices of either potatoes, turnips, parsnips, apples or carrots, sticking in each slice a small wooden skewer, to take it easily out of the soil with, also to mark the spot where the bait is buried. Examine these baits every day, or at farthest every other day, and kill the insects collected upon them. Some gardeners give preference to sliced beet root, or cabbage stumps, or young lettuce plants; whatever is used, there must be no neglect in examining and destroying the worms on them. After they have fed for five years, they go into the pupa state, *b*, and shortly appear as a chestnut-coloured beetle, when their existence appears to be very limited.



Culture of the Garden Pink (*Dianthus plumarius*).—The pink has not been grown as a florist flower so long as the carnation. Till within the last fifty years they were merely grown as border flowers, but so many new and beautiful varieties have since been raised, that it is now much prized and cultivated by amateurs. It is more hardy than the carnation, and much less expensive. Make the beds as follows:—

44. Mix a quantity of fresh loamy soil with an equal portion of cow-dung, which has lain to rot for two years; and after having removed the old soil a foot and a half deep, make the deficiency up with the new compost, raising it somewhat higher than the surrounding surface, falling on each side from the centre, to cast off any excess of wet, and this should be repeated every successive year.

45. Plant out in September those intended for blooming the following summer, for if delayed until spring, they never flower so well, or show half the beauty as under other circumstances.

46. To have good flowers, the plants must be young, it is, therefore, indispensable when this is a desideratum, to raise new plants from pipings every year, because one year old plants bloom very superior to those of any other age.

47. Put in the pipings about the middle or end of June, but never later than the first week in July; they will then be about two inches long. Prepare them after the manner recommended for carnations.

48. When the pipings are prepared, choose a shady part of the garden to plant them, and having dug the soil, which must be light and sandy, and smoothly raked the bed, water it with a rose watering pot, until the soil is completely saturated;

then stick in the pipings about three inches apart, and place a hand glass over them. They will not require watering at that time if the soil was well wetted previous to inserting them in the bed.

49. When the pipings have begun to grow, and not till then, the glass may be removed for the first time: this will happen in about three weeks after they are planted. They may then be gradually exposed every fine day, until they are able to bear the open air.

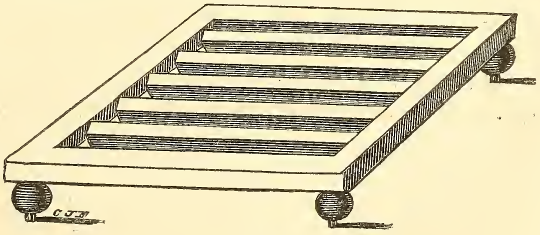
50. In hot weather, it is necessary to shade the buds, both previous to opening and after they have opened, as recommended for carnations. This is generally done by placing small boards over them, similar to those figured and described for auriculas, page 10.

Seeds and layers may be treated after the same manner as carnations.

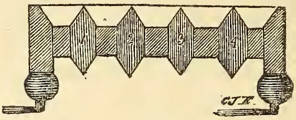
Criterion of a fine Pink. "The stem should be strong and erect, and not less than twelve inches high. The calyx smaller and shorter than that of the carnation, but nearly similar in proportion, as well as in the formation of the flower, which should not be less than two inches and a half in diameter. The petals should be large, broad, and substantial, and have very fine fringed or serrated edges, free from deep notches or indentures; in short, they approach nearest to perfection when the fringe or edge is so fine as scarcely to be discernible; but if they could be obtained entire, it would be a desirable object. The broadest part of the lamina or broad end of the petals, should be perfectly white, and distinct from the eye, unless it be a laced pink, that is, ornamented with a continuation of the colour of the eye round it, bold, clean and distinct, having a considerable proportion of white in the centre, perfectly free from tinge or spot. The eye should consist of a bright or dark rich crimson or purple, resembling velvet, but the nearer it approaches to black, the more it is esteemed: its proportion should be about equal to that of the white, that it may neither appear too large nor too small."—*Maddock.*

OPERATIONS FOR APRIL.

As April is proverbial for showery weather, it may not be amiss to introduce a figure of a garden scraper, which was furnished us by Mr. Saul of Lancaster, and was inserted in our Horticultural Register, vol ii. page 128.



It has long been known on the Continent, and only requires to be brought into notice, to be more adopted in this country. It is made of hard wood, and answers exceedingly well. In the section 1, 2, 3, 4, are the bars fixed in a frame about two feet long; the bars are one inch thick, by two inches deep, and are placed about two inches apart, so that the gravel falls through betwixt the bars. It might be made of cast-iron, and the bars be hollow.



Annuals, both hardy and tender, may still be sown. See page 22.

Auriculas coming into flower must have the small buds thinned out, never leaving more than ten buds, and those of the finest size. Shelter from the sun by shades, as recommended page 10.

Biennials should now be attended to: see page 66.

Cactæ of various species treat as recommended page 49.

Camellias should now be potted: in doing it attend to the rules laid down p. 33.

Carnations: plant off the last year's layers into large pots, as recommended page 69.

Cineraria. Different species may be sown as soon as they are ripe, in pots of light rich earth.

Dahlias must be treated as recommended page 39. Transplant those sown last month.

Erica. Cuttings may now be planted in sand under a bell glass, and place the pots on a shelf in the green-house and shade them from the sun.

Hydrangeas may still be propagated by cuttings, and treated as recommended in March.

Pomegranates may be propagated by layers about the end of the month. See page 65.

Ipomopsis elegans should be treated as recommended page 27.

Lobelia fulgens may now be shifted into good-sized pots, in which it will flower.

Mimulus roseus. Smithii, Youngii, and others, will now be coming generally into flower in the green-houses: treat them as recommended page 29. Sow the annual species in the beginning of the month.

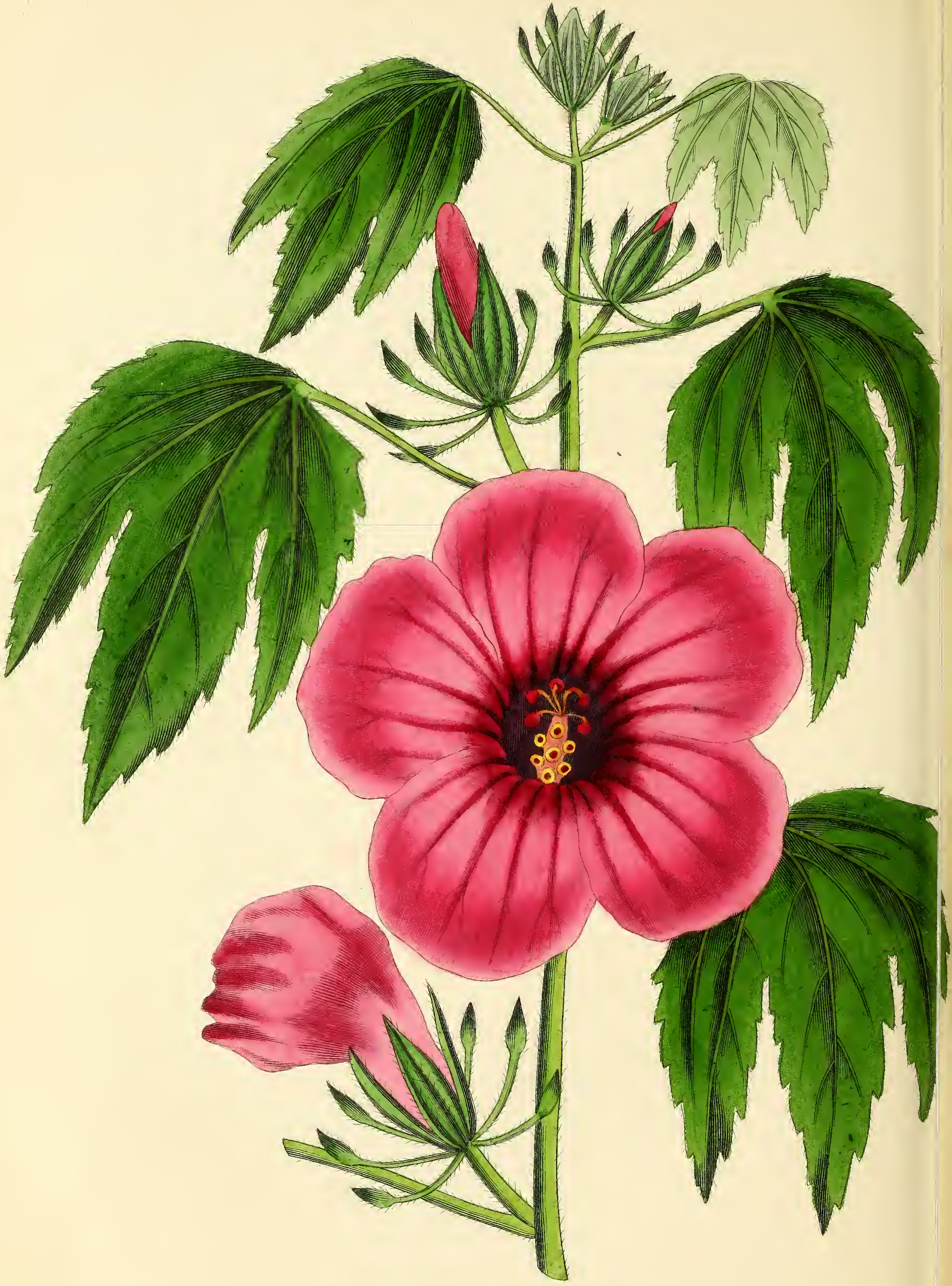
Passiflora Kermesina and other species may be propagated by cuttings about the end of the month. See page 25.

Pelargoniums now struck in a hotbed frame, and potted off as soon as rooted, will flower in November.

Ranunculuses planted in the beginning will flower in July. For the general treatment, see p. 42.

Rose-trees may now be budded, but the buds must have a small portion of wood adhering to them.

Schizanthus retusus, and other half-hardy species and varieties, should be repotted this month if they require it. See page 39.



Hibiscus Lindlei.

HIBISCUS LINDLEI.

MR. LINDLEY'S HIBISCUS.

CLASS.	ORDER.
MONADELPHIA.	POLYANDRIA.

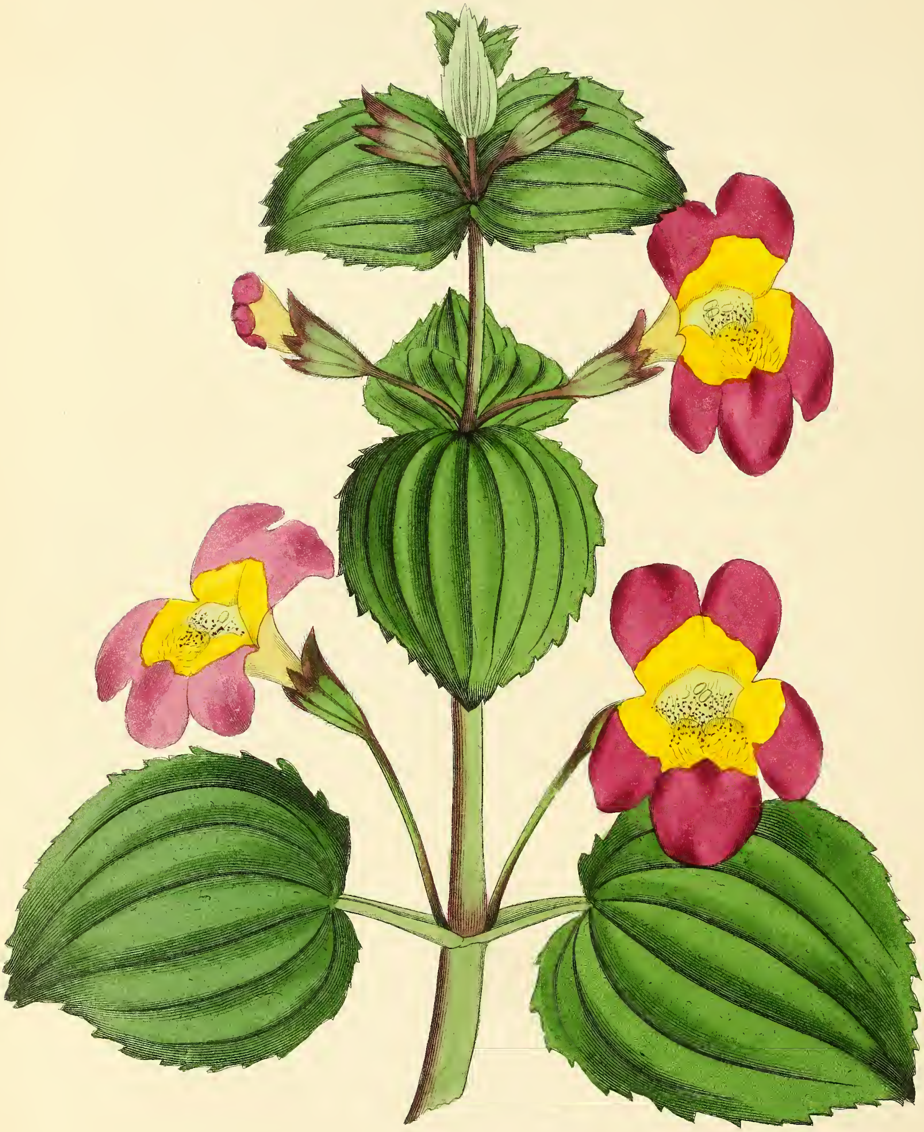
NATURAL ORDER.

MALVACEÆ.

Generic Character.—*Calyx* double, outer one many-leaved. *Stamens* unlimited in number. *Stigmas* five. *Capsule* five-celled, many-seeded.

Specific Character.—Stem half-shrubby, rough, and somewhat spiny. Leaves dark-green, shining divided into from three to seven parts, each division spear-shaped, with serrated edges, and slightly covered with hairs. Flowers axillary and solitary. Calyx covered with stiff white spiny hairs. Corolla rich crimson-purple, very showy.

This very fine species was introduced by Dr. Wallich, in 1828, to the Horticultural Society Gardens. It is a native of the Burman empire, growing near Ava. It is of course a stove plant, growing very freely in a mixture of rich loam and peat, or light rich loam alone, rising to a shrub five feet high, and producing a great abundance of splendid flowers, which, although of very short continuance, are succeeded by others every day during winter and early spring. It is easily propagated by cuttings, which may be planted in light rich soil; and if placed under a hand-glass, in heat, they will root very freely. All the species are showy, and most of them deserve a place in every collection of plants. The general treatment of the genus is as follows: All the shrubby stove kinds, as *splendens, Rosa Malabarica, unidens, racemosus, ficuloides,* &c., thrive best in a mixture of light rich loam and peat; but those which form trees, as the *mutabilis, tiliaceus, Rosa sinensis, phœniceus,* &c., will do better if the peat be wholly omitted, and they be potted in rich loam alone. They all strike readily by cuttings planted either in mould or sand, under a hand-glass in heat. The stem of the *racemosus* is thickly covered with hairs, which, when pressed by the hand, occasion a prickling or stinging sensation. The *N. ficuloides* always thrives best if placed on the hottest part of the flue of the stove; and, unlike most other plants requiring hot situations, it does the best when the roots are cramped in a very small pot: with this treatment, it will flower with the greatest freedom throughout most of the year. The *mutabilis* should have plenty of room allowed for its roots; if it is convenient, the best way is to turn it out into a bed of good loamy soil, when it will soon form a tree from thirteen to twenty feet high, and its changeable flowers have a beautiful appearance. They open in the morning of a yellowish green colour, they shortly afterwards change to white, about mid-day they begin to show a tinge of red, and towards evening they attain to a full bright crimson rose colour, after which they shortly begin to fade and die. The *tiliaceus* is said to form a tree twenty feet high in the East Indies, with a very thick bole: the natives make small cordage of its bark. In this country it seldom reaches above ten or twelve feet in height. The green-house shrubby species, as *strigosus, pedunculatus, Richardsoni, heterophyllus*, &c., require nearly the same treatment as the stove kinds. *H. heterophyllus* is said to be manufactured into a rude cordage in New South Wales, its native country. The stove herbaceous species, as *speciosus, crinitus*, &c. will require a little different treatment from the shrubby species: when they die down, give them very little water, and just before they commence growing again, re-pot them in light rich soil, &c.; give them a good supply of water during the growing season. Some may be propagated by seeds; others by division of the roots. The tender annual species, as *radiatus, digitatus*, &c., should be sown in pots, and treated in the same way as other tender annuals (see page 20). The hardy annual species, as *Trionum, vesicarius*, only require to be sown in the open border, like other hardy annuals (see page 18). The *Syriacus*, or *Althæa frutex*, is the only shrubby species that is hardy: there are seven or eight varieties raised from it, all of which are very ornamental; they will all thrive in any common garden soil, and may be raised in abundance from both seeds, layers, and cuttings: the latter will strike freely under a hand-glass, in a shady situation. The hardy herbaceous species, as *virginicus, palustris, aquaticus*, &c., thrive best in rather a wet soil, slightly sheltered in winter, and may be increased by dividing the roots.



Mimulus variegatus

MIMULUS VARIEGATUS.

VARIEGATED MONKEY FLOWER.

CLASS.	ORDER.
DIDYNAMIA.	ANGIOSPERMIA.

NATURAL ORDER.

SCROPHULARINEÆ.

Generic Character.—See page 29.

Specific Character.—Stem smooth; leaves ovate, denticulate, slightly hairy, with from seven to nine smooth ribs; calyx smooth; teeth unequal, sharp pointed, turning somewhat backwards; corolla twice the length of the calyx; ground colour yellow; each lip blotched with rich carmine, throat much spotted, and hairy on the lower part; stamens somewhat shorter than the tube of the corolla; peduncules twice the length of the calyx.

This is a native of Chili; and, according to Messrs. Loddiges, was first introduced into France, and from thence to England.

We have a number of fine plants at Chatsworth; each of which are now (April 7th) a perfect picture of flowers. They thrive exceedingly, potted in light rich loam, with their pots set in pans of water, and placed in the green-house. The plants ripen plenty of seeds, and by them may be readily propagated.

Since the figure of Mimulus Smithii appeared, a friend has kindly furnished us with the following account of its origin. "It was produced by impregnation with *rivularis* as the male parent, and *variegatus* the female, by Mr. George Smith, of Islington Nursery, London, who has further improved this beautiful family; specimens of which he possesses exceeding in beauty the one referred to, being not only marked with distinct spots on each petal, but regularly laced round the extremity, the lower lip having three dark marks, and the yellow considerably deeper."

FRANCISEA HOPEANA.

ONE-FLOWERED FRANCISEA.

CLASS.	ORDER.
DIDYNAMIA.	ANGIOSPERMIA.

NATURAL ORDER.

SOLANEÆ.

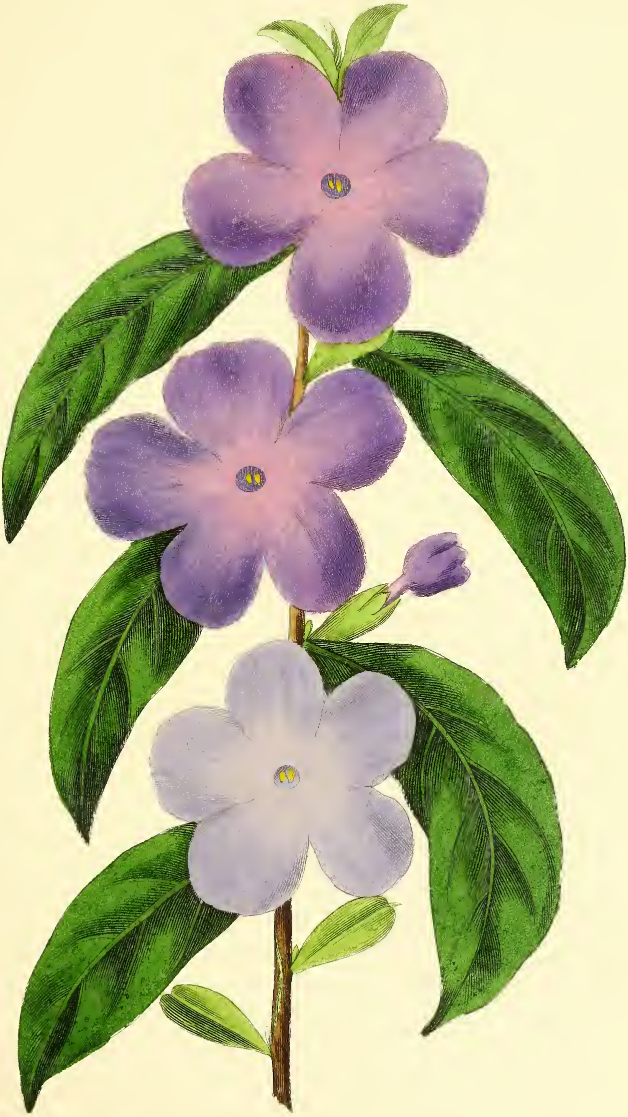
Generic Character.—*Calyx* campanulate, permanent, somewhat swelled, having five equal teeth. *Corolla* salver shaped, cut into five unequal parts; tube half an inch long. *Style* somewhat thick at the top. *Stigma* two-lobed.

Specific Character.—Plant shrubby; branches short; leaves oblong-lanceolate, alternate, dark green, waved on the edges, smooth and shining; flowers very fragrant, solitary, usually produced on the naked stem where it is destitute of leaves, but sometimes terminating the short spur-like branches; tube of corolla much narrower than the calyx, and extends about two-thirds longer; of a pale purple colour; limb of the corolla divided into five spreading lobes, bright purple at the first opening, and afterwards fading until it becomes white; mouth of the tube yellowish white on the lower margin.

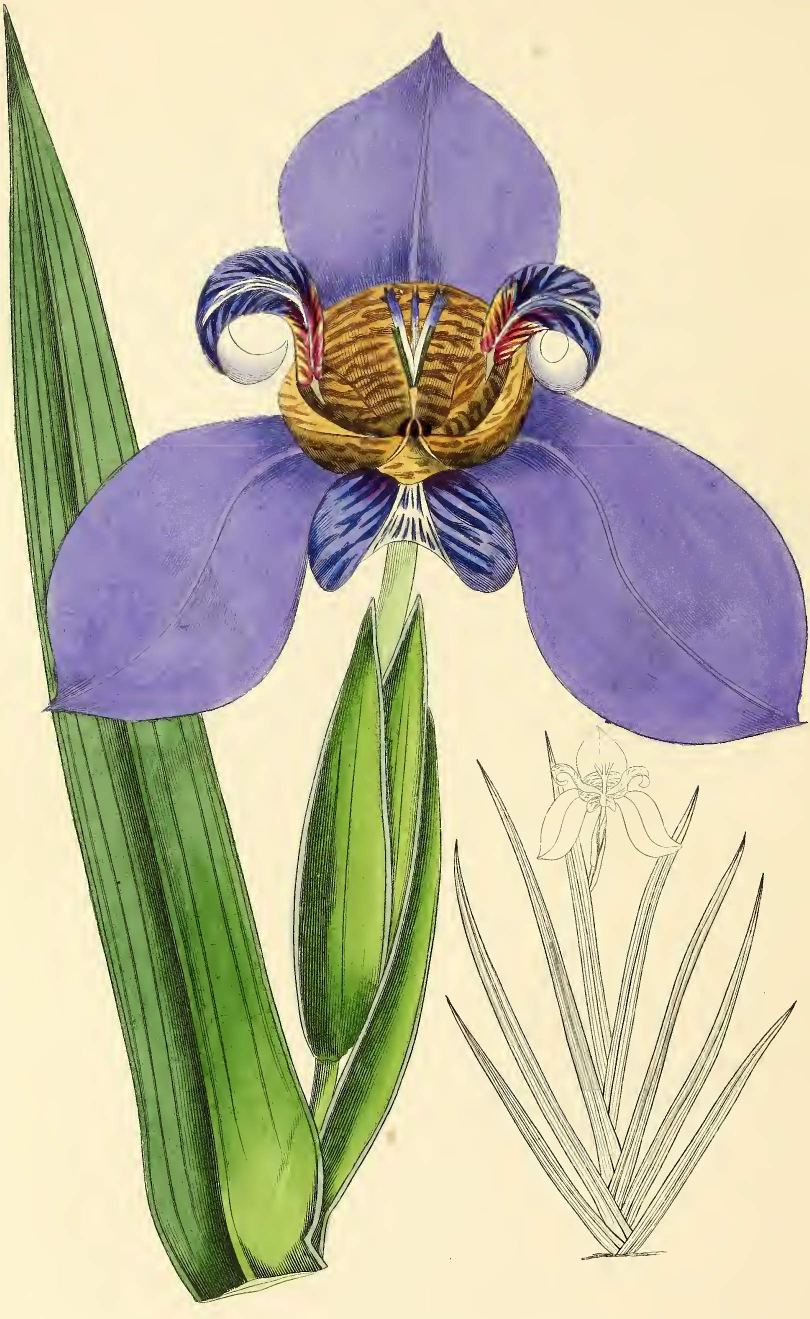
The plant, from which the accompanying figure was taken, flowered in the stove at Chatsworth, in March last, and certainly had a very beautiful appearance: the fragrance emitted was very delightful. The plant was first introduced from Brazil by Marshal Beresford, to his sister, Mrs. Thomas Hope, of Deepdeen, after whom it has been named by Dr. Hooker.

It requires the constant heat of the stove, and thrives in a loamy soil, mixed with peat, and may be propagated by cuttings of half ripened wood.

The generic name is given in honour of Francis the First, emperor of Austria.



Francisca Hopeana.



Marica Sabini.

MARICA SABINI.

CAPTAIN SABINE'S MARICA.

CLASS. TRIANDRIA. ORDER. MONOGYNIA.

NATURAL ORDER. IRIDEÆ.

GENERIC CHARACTER.—*Flowers* with six petals, three inner and three outer,—the outer ones much larger than the inner ones,—the latter usually somewhat curled. *Style* short. *Stigma* like three petals, coloured, segments undivided. *Capsules* three-celled.

SPECIFIC CHARACTTR.—Leaves spear-shaped, very slightly ribbed, yellowish green, stigmas united; the same kind of blue colour as the petals; outer petals very rich purple blue, inner ones much curled, and beautifully marked with dark blue; cup, or centre of the flower, richly streaked with brown on a yellowish ground; scape many flowered; spathe not viviparous.

THE species of this genus are both curious and beautiful: the *Northiana*, *cærulea*, and the present subject, are particularly handsome, and are usually free flowerers: both the *Sabini* and *cærulea* are now in flower at Chatsworth, in our stoves. All the genus thrive in a mixture of sandy peat and light loam; and, with the exception of *M. semi-aperta*, they all require the heat of the stove. There is a remarkable peculiarity in the *M. Northiana*, which must not be passed over. The spathes are viviporous; that is, they produce young plants within them. The flower stem bends backwards, until it usually touches the ground. The flowers are very handsome, and are produced pretty freely when the plant is properly treated; but if allowed to remain amongst green-house plants, it will sometimes continue for years without showing any disposition to flower. The best way is to keep it in the stove, and whilst growing give it a good supply of water; and, as the suckers appear, strip them off. It rarely produces seeds, but is very readily increased by suckers and offsets. Some species, however, will produce seeds if the stigmas are fertilised with pollen at the proper time. The best time to sow the seed is as soon as it is gathered, in the same kind of soil in which the plants are potted; and if the pots in which they are sown be plunged in a dung-bed, or bark bed, they will soon vegetate.

The present subject was introduced to the Horticultural Society Gardens, in 1822, and was named by Dr. Lindley in honour of Captain Sabine. The flowers possess a superior richness to the *M. cærulea*, but are inferior in point of size. They emit a delightful fragrance during the time the flowers are expanded.

Properties of the Natural Order, Irideæ.—The plants of this order are generally natives of the Cape of Good Hope, Europe, and some parts of North America. The tropical countries produce very few species; and though *Marica* and *Moræa* are found in hot climates, by far the greater part inhabit more temperate regions. Their medical properties are very trifling; for, with few exceptions, they are more remarkable for beauty than utility. The *Iris Florentina*, and *Germanica*, produce the fine violet-scented powder and root, sold in our chemists' shops under the name of Orris root, or Iris root. The seeds of the Iris, *pseudo-acorus*, when roasted, very nearly resemble coffee in quality. Saffron is the dried stigmas of a crocus, which possesses a valuable colouring matter, to which the name of *Polychroite* has been given. These properties, with a few more of less note, may be considered as the chief uses of *Irideæ*. The genera of this order are as follows:—

Iris,
Moræa,
Marica,
Streptanthera,
Patersonia,
Orthrosanthes,
Witsenia,
Aristea,
Ferraria,
Tigridia,
Herbertia,
Galaxia,
Cypelia,
Vieusseuxia,
Homeria,
Spatalanthus,
Lapeyrousia,
Anomatheca,
Babiana,
Antholyza,
Anisanthus,
Watsonia,
Gladiolus,
Synnotia,
Pardanthus,
Bobartia,
Sisyrinchium,
Renealmia,
Sparaxis,
Tritonia,
Ixia,
Melasphærula,
Heperantha,
Geissorrhiza,
Trichonema,
Crocus.

Culture of the genus Iris.—The name of Iris was given to the plant by Theophrastus and Pliny, from the variety of its colours. This well known, but beautiful genus, is rarely met with in America, but it abounds in Europe. The chief part are tuberous rooted, and are propagated by dividing the roots, but some are bulbous. The modes of culture, although in almost all cases simple and easy, vary considerably. Some species delight in exposed, and others in shady situations; some in sandy soils, and dry situations; others in rich loamy soils, and moist situations; the greater part are perfectly hardy, but some few require shelter, having a variety of peculiarities, which renders it necessary to mention the species rather particularly. A great number of them will grow without any particular care, in almost any soil and situation, as the *Hungarica, Nertchinskia, lurida, Germanica, graminea, Xyphium, Nepalensis*, &c. &c. The *Hungarica* does very well in a pot; but requires, in that case, to be planted in a rich and good soil. The *Germanica* produces the colour called "Iris green;" to obtain which the flowers are macerated; and, having been left to putrify, chalk or lime is added. This species, in connexion with the *Florentina,* are planted about the graves in Florence, as a token of respect to the deceased. The flowers of *Xyphium* have a scent greatly resembling coriander seed. The *xiphioides* is a very free seed bearer; it is bulbous as well as *Xyphium.* The bulbs are imported annually from Holland, and should be planted early in the autumn. The *biglumis, sisyrinchium, pallida, arenaria, tenax, Persica,* &c. &c., must be planted in a light sandy soil, and in a situation where they will receive but little moisture, being for the most part very impatient of wet, particularly the *pallida, arenaria,* and *tenax.* The *pallida* should also be planted in a sunny situation, where it is sheltered a little from cold winds, it being more tender than some of the other species. It is often called the Dalmatian Iris. The *tenax* grows in open parts of the woods of North California. From the veins of the leaves the native tribes make fine cord, which is converted into fishing-nets; and for its buoyancy, great strength, and durability, it suits this purpose admirably. The *Persica* will blow in water-glasses like hyacinths; but it flowers much stronger in a pot of sandy loam, sandy peat, or even pure sand. It has a most delightful fragrance when in blossom; and a flower or two expanded will scent the whole apartments. It is not hardy, although it will blow well in the open air, but requires a degree of warmth and shelter. The *bicolor, crassifolia, verna, dichotoma, aphylla, tuberosa,* &c. &c., thrive the best if planted in a mixture of equal parts of rich loam and leaf mould, or peat. The *bicolor* is not perfectly hardy, but will require the shelter of a frame in cold weather. Its flowers are beautifully delicate, and soon become faded if exposed to the powerful influence of the mid-day sun; it is therefore advisable to place it, during the time of flowering, on a northern aspect, where the delicate blossoms will continue for some time. The *crassifolia* requires the shelter of the green-house. The *dichotoma,* or scissor plant, should be planted in a sheltered part of the flower border, where it will not receive much moisture. The *aphylla* is far from being common; I scarcely remember meeting with it in any of the gardens I have had the pleasure of visiting: the flowers emit a scent like the orange tree. The *tuberosa* is found growing wild both in England and Ireland: when cultivated in our gardens it very seldom flowers, but perhaps this, in many instances, may proceed from the want of a peculiar treatment. It ought always to be allowed to stand three years at least in the situation where it was first planted; for if it be often removed it suffers damage. Towards the end of August the fibrous roots begin to grow; after that time, if the soil be disturbed near the plant, the roots will be injured, and flowering prevented. The situation should be warm, sunny, and free from wet. When it produces seeds, let them be sown immediately after being gathered, in the same kind of light soil in which the parent plant grows. In propagating by offsets, dig up the tubers as soon as the leaves of the plant turn yellow in summer. As soon as they are taken up, and sufficiently divided, plant them immediately; for if dried in any degree, they receive injury. The depth at which they are to be planted should be six inches.

The *reticulata, susiana,* &c., require a light soil, but it should be made rich. The former of these needs the shelter of a pit, or frame, in winter. It is usually increased by off-sets, but occasionally ripens seed, if the plant be protected from wet, and freely exposed to pure air when in flower. The latter may be planted in a somewhat stronger soil than the other, in a situation exposed to the full blaze of the sun, and where the air is pure. Moisture is particularly injurious to this species, often proving fatal. In a very wet or severe season the roots often perish. It is advisable to keep a few in pots, either in a frame or the green-house, during winter. The mode of propagation is, by cutting off pieces of the roots, for it very seldom ripens any seeds. The *amœna, sambucina, ochroleuca,* &c. &c., thrive best when planted in a good rich loam: the *sambucina* is calculated for a shrubbery rather than small flower borders. All the aforementioned three, in connexion with *Virginica, flavissima, spuria,* and several others, require planting in a moist situation, or they do not grow to any degree of perfection. The *cristata* also thrives best in a moist situation, but it must be planted in bog earth (not peat); and if covered with a hand-glass, or some other kind of covering, in severe weather, it will do well. The *Chinensis* has a complete creeping root; it flowers well in the green-house, and does very well in the open border. The *clandestina* requires the heat of the stove, and should be potted in sandy loam and peat. The best for forcing are *Susiana, Persica,* and *Chinensis.*

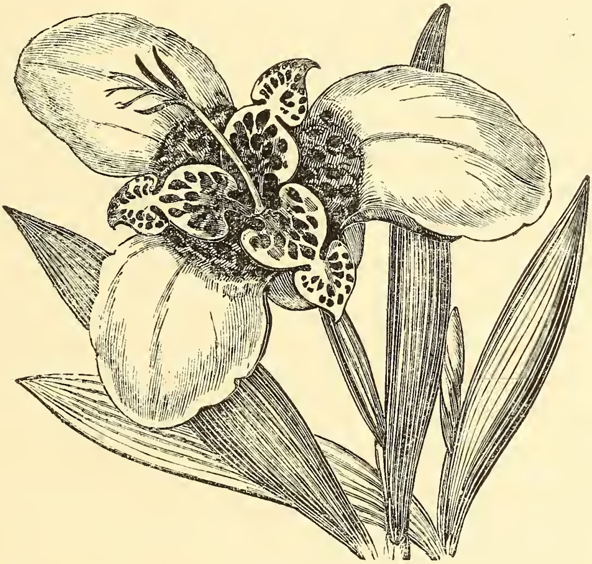
All the tuberous rooted species are propagated by dividing the roots, for the most part in the autumn, and the bulbous species by off-sets.

CULTURE OF TIGRIDIA PAVONIA.

1. Sow the seeds about the end of March or beginning of April, in pans or boxes, and place the pans or boxes in a cucumber frame, where they will receive about sixty degrees of heat; and keep the frame closely shut until the plants begin to appear.

2. As soon as the plants are up, admit air pretty freely in the middle of the day, whenever the weather will permit; and by the middle of May they will be ready to transplant.

3. In preparing for transplanting them, make up a slight hot-bed, and in about three days, when the bed is settled, level the surface, and lay on some rich light soil, to the depth of six inches: in about three days after the soil is laid on, the bed will be ready to receive the plants.



4. Plant the seedlings in rows four inches apart, and two inches in the row; give them a gentle watering, and put on the lights: keep them closely shut down for a few days, and shade them from the mid-day sun until they have again commenced growing.

5. As soon as they are well established, give them plenty of air to prevent their growing weakly; and about the beginning of July they may be fully exposed to the weather.

6. When the leaves begin to decay, take up the roots, and lay them in an airy situation to dry, in the same manner as tulips, &c. After they are dry put them in paper bags, and lay them out of the reach of frost during the winter.

7. Early in the following April prepare a bed in the open ground, in a warm, sheltered situation.

8. The bed being prepared, plant the roots in rows eight inches apart, and four inches in the row, covering them first to the depth of the top of the crown: always keep them free from weeds, and when the leaves begin to decay take them up as before.

9. At the second year's planting the largest bulbs should be selected, and planted on a separate bed; and many of them will flower this third year.

10. When it is desired to have them flower early in the spring, plant them in pots, and place them in a hot-bed or vinery about the beginning of February.

11. The best soil to plant them in, is composed of one-sixth of rotten dung, one-sixth of leaf-mould, one-third of fresh light loam, and one-third of fine white or red sand.

12. Always be careful that the bulbs are well matured when taken up in the autumn, or they are apt to rot during winter; and if they are preserved until spring, they become so exhausted by the means used to keep them, that when planted, the flowers, if any are produced, are extremely weak.

13. To remedy this, plant them in a light soil and warm situation, being careful never to plant them deep enough to cover the crowns. If this be attended to, and they are taken up as soon as the tops decay in the autumn, before they are saturated with wet, and carefully preserved dry through the winter, they will flower freely.

14. In front of the wall of a hot-house, the roots will survive most of our winters, and will flower in succession all the following summer and autumn, and will abundantly increase; but in any other situation this system can rarely be depended upon, and therefore it is always advisable to take them up on the approach of frost; and if they are not ripe, dig them up with the soil about them and place them in a greenhouse or frame.

15. Separate the offsets in spring, and treat them in the same way as the old bulbs.

16. To obtain flowers somewhat earlier than the usual season, it is only necessary to plant the roots in pots, and place them in a forcing-house or hot-bed frame, until all danger of frosts is over; and after being exposed to the air by degrees, turn them out into warm situations in the borders.

CULTURE OF THE ŒNOTHERÆ.

The name Œnothera is derived from *Oinos*, wine, and *thera*, a catching, because the roots are said to smell like wine; and the ancients supposed that, when mixed with drink, they possessed the power of calming the most ferocious animals. They are also said to allay intoxication. It is, however, doubtful whether our Œnothera is the real genus to which Theophrastus applied the name. Most of the annual species thrive and flower best in poor and gravelly soil, but they will grow rampant and strong in rich soil, though their flowers neither possess that degree of beauty, nor can the permanence of the colour be relied upon so much as when grown in poor land. Perhaps none show marks of degeneracy sooner than the *Œ. bifrons;* while the *Œ. sinuata* and *tetraptera* may be considered exceptions; for they appear to flower better if grown in a light middling rich mould. The *Œ. viminea* comes into flower about the end of April, if planted on dry situations, but its time of flowering is then shorter than when planted in a damper place.

All the purple-flowering annual species, as *Œ. decumbens, quadrivulnera, purpurea, viminea, Romanzovi, Lindleyana, tenuifolia,* &c., when cultivated in a patch, in a large garden-pot filled with poor soil, will flower in much greater perfection than in the open border; yet their flowering season is of much shorter duration. They are perfectly simple in their culture, merely requiring to be sown in the border, or in the pot where they are intended to flower. In every other respect the treatment is like other hardy annuals.

BIENNIAL SPECIES.—Those of biennial duration are all hardy, with the exception of *Œ. nocturna* and *villosa,* which were introduced from the Cape of Good Hope, and consequently require the shelter of the green-house. The roots of *Œ. biennis* are eaten in Germany, and in some parts of France. They have a nutty flavour, but are very inferior to the rampion. They are both stewed and eaten raw in salads, with mustard, oil, salt, and pepper, like celery. Lippold says they have been long used as a culinary vegetable, under the name of German Rampion. It was from this species that the genus took the name of Evening Primrose, because its flowers seldom expand till towards six or seven o'clock in the evening. A few other species evince the same disposition, but the generality of them, including annuals, biennials, and perennials, are open all day, making, at the time of flowering, a beautiful show in the borders. The mode in which the flowers open is highly curious. The segments of the calyx first begin to separate at the bottom, and to expose the inclosed corolla; while at the top it is held tightly together by the hooks at the end of the calyx. In about a quarter of an hour the flower obtains sufficient strength to unhook the calyx at the top, which being accomplished, the expansion proceeds rapidly for about five minutes, when it again slackens, as though to recruit its strength previously to spreading out quite flat.

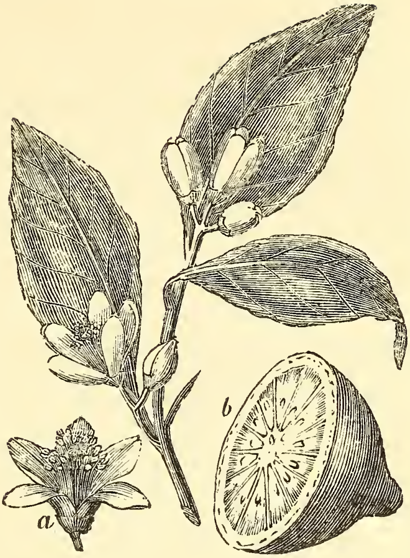
PERENNIAL SPECIES.—All these are hardy, except *Œ. rosea, acaulis, cæspitosa* and *anisoloba,* which require slightly sheltering. The first of these should be grown in peat and loam, in a pot which, during winter, should be sheltered in a frame, though it may be turned out in the borders after the frosts are over. The *Œ. acaulis* is a native of Chili, where it is very common in waste places; and according to Ruiz and Pavon, it is there administered in the form of infusion for medical purposes. It will grow well in common poor soil, and requires similar treatment to the last. The *Œ. cæspitosa* often perishes from too much moisture; and to prevent this, all the damp soil should be removed from the roots on the approach of winter,—say about the end of October; and there should be put in place of it a quantity of dry soil. The plant may then be covered with dry saw-dust, and the pot set over it with the hole well stopped, to prevent the entrance of rain or snow. Let it remain there until the beginning or middle of March, and then take away the pot and saw-dust, and put some good fresh earth about the roots. Place a hand-glass over the plant for a few days, until it will bear exposure. To propagate this species, take up the plants in the beginning of October, shake the soil from them, and break the roots into small pieces about one inch and a half long: plant about six of these pieces in each forty-eight sized pot, filled with good light soil, made rather dry. Set them in a frame, and give them no water throughout the winter; in March begin to water them, very gently at the first, increasing the quantity as they grow, and they will soon become fine plants. The *Œ. anisoloba* is a fine showy plant, but unless well protected through the winter, after the same manner as *Œ. cæspitosa*, it seldom survives. It thrives best in peat and loam. If the seeds be sown in the beginning of March on a hot-bed, and the plants be taken up with a trowel in bunches, and placed in the borders at the end of April, they will flower in June the first year, and produce plenty of seeds. All the other perennials are very easy of culture; and, with the exception of *Œ. fruticosa*, *macrocarpa*, *Missouriensis*, *pallida*, *glauca*, and *Fraseri*, will grow in any common soil. These six species, however, require to be planted in sandy peat earth; they may all be increased by cuttings, taken off in May, and planted in light rich soil under a hand-glass, by seeds, and by division of the roots; but in this last method care must be taken not to mutilate them too much, or they will not grow healthily.

CULTURE OF KENNEDIA RUBICUNDA.

This plant should be potted in a mixture of sandy loam and peat. It requires moderate watering; that is, it should never be allowed to become very dry; and if on the other hand too much water be given, the plant will be sickly, and the soil will be covered with moss, which ought never to be allowed to grow. It is a creeper of the easiest culture, and will grow in almost any situation in an airy greenhouse; but New Holland plants will not thrive in heat. A healthy plant would derive benefit from being set out of doors in a shady situation during summer month, but a sickly one would not.

CULTURE OF THE GENUS CITRUS.

This genus contains the Orange, Lemon, Shaddock, and Lime, all of which are green-house or conservatory plants, and require very similar treatment. The *C. medica* is thought by some writers to have been cultivated in Italy so early as before the time of Virgil and Pliny; but the Lemon was not cultivated in Britain till 1648, when it was grown in Oxford Botanic Garden. The *C. aurantium*, or Orange, is cultivated in our conservatories to great perfection. It is not quite certain at what time the Orange tree was first cultivated in England. The "Hortus Kewensis" places it before 1629; but there is general tradition that it was introduced during the reign of Elizabeth, which would place it at least before 1603, the year in which she died. Among the earliest, if not the very earliest, Orange trees cultivated in this country were those planted by Sir Francis Carew, at his seat at Beddington, in Surrey, of which Lyson gives the following account:—



a, Flower, showing the division of the stamens into three bundles; *b*, section of the fruit.

"When Sir Francis Carew became possessed of the inheritance of his ancestors, which had been forfeited by his father's attainder, he rebuilt the mansion-house in a very magnificent manner, and laid out the gardens, which he planted with choice fruit-trees, in the cultivation of which he took great delight, and spared no expense in procuring them from foreign countries. The first Orange trees seen in England are said to have been planted by him. Aubrey says they were brought from Italy by Sir Francis Carew; but the editor of the 'Biographia,' speaking from tradition preserved in the family, tells us they were raised from seeds of the first oranges which were imported into England by Sir Walter Raleigh, who married his niece, the daughter of Sir Nicholas Thockmorton. The trees were planted in the open ground, and were preserved in the winter by a moveable shed: they flourished for about a century and a half, being destroyed by the hard frost of 1739-40."

In the account given of these same trees in the celebrated Peter Collinson's MS. notes, in his copy of "Miller's Gardener's Dictionary," which were published by A. B. Lambert, Esq., in the "Linnean Society's Transactions," Vol. X., there is some difference, and, I think, some errors corrected in the foregoing account of Lyson's. Mr. Collinson's note is as follows:—

"From my nephew Thomas Collinson's Journal of his Travels, 1754.—In the reign of Queen Elizabeth, anno ——, the first Orange and Lemon trees were introduced into England by two curious gentlemen; one of them Sir Nicholas Carew, at Beddington, near Croydon, Surrey. These Orange trees were planted in the natural ground. Against winter an artificial covering was raised for their protection. I have seen them some years ago in great perfection; but this apparatus going to decay, without due consideration, a green-house of brick-work was built all round them, and left on the top uncovered in the summer. I visited them, a year or two after, in their new habitation, and, to my great concern, found some dying, and all declining ; for although there were windows on the south side, they did not thrive in their confinement, but being kept damp with the rains, and wanting a free, airy, full sun all the growing months of summer, they languished, and at last died.

" A better fate has hitherto attended the other fine parcel of Orange trees, &c. brought over at the same time by Sir Robert Mansell, at Margam, (late Lord Mansell's, now Mr. Talbot's,) called Kingsey Castle, in the road from Cowbridge to Swansea, in South Wales. My nephew counted eight trees of Citron, Limes, Bergamottes, Seville, and China Orange trees, planted in great cases, all ranged in a row before the green-house : this is the finest sight of its kind in England. He had the curiosity to measure some of them. A China Orange tree measured, in the extent of its branches, fourteen feet ; a Seville Orange tree was fourteen feet high, the case included, and the stem twenty-one inches round ; a China Orange tree twenty-two inches and a half in girth.

" July 11th, 1777.—I visited the Orangery at Margam in the year 1766, in company with Mr. Lewis Thomas, of Eglwys Nynngt, in that neighbourhood, a very sensible and attentive man, who told me that the Orange trees, &c., were intended as a present from the King of Spain to the King of Denmark ; and that the vessel in which they were shipped being taken in the channel, the trees were made a present of to Sir R. Mansell*."

1. Propagation. All the species may be propagated by either seeds, layers, cuttings, budding or grafting. The three first modes usually to obtain stocks for budding and grafting.

2. Lemon *seeds* are the best for stocks. After having procured sufficient, about the middle of February sow in thirty-two or twenty-four sized pots, filled with light rich mould, covering the seeds not less than a quarter of an inch, or more than half-an-inch thick with soil ; spread over the soil a little moss to keep the sun and air from drying it.

3. After the seeds are sown, plunge the pots in a good hot-bed, where they must be allowed to receive not less heat than 75°, nor more than 80° Fahrenheit ; and in ten days or a fortnight they will be up, after which the moss may be removed from the top of the soil, and a little air may be occasionally given.

4. In six weeks or two months the young plants will be ready to transplant into single sixty-sized pots, filled with good light loam. Be careful that the pots are well drained, which is of the greatest importance.

5. When transplanted, again plunge the pots in a good hot-bed, with the heat so

---

* It is not improbable that the vessel mentioned might have been taken by Sir Walter Raleigh, who was so much employed against the Spaniards in Queen Elizabeth's reign ; and the Orange trees divided between the Carew and Mansell families.

tempered that the young roots will not be injured; keep a regular close heat until the plants have begun to grow, afterwards give them air, but yet keep up a brisk warmth to facilitate their growth, and by August they will have become fine plants, when they may be placed amongst the young camellias until wanted for grafting or budding.

6. CUTTINGS. The best time for putting in cuttings is just when the plants from which they are to be taken have begun to grow, which will depend on the situation and treatment of the old plants.

7. Wood of from one to thirty or forty years old, and cut to any length, from eight to eighteen inches, will grow equally well; the larger and older the cuttings, the sooner they will make large plants and produce fruit.

8. At whatever age the wood is, let the cuttings be of equal length; and so many of the leaves must be cut off as will allow each cutting to be placed six inches deep.

9. In gathering the cuttings, take a sharp knife and cut them right across; it does not particularly signify whether exactly at a joint, but they are all the better for being cut at a joint.

10. Place the cuttings in pots, the best for the purpose are eight inches deep and six wide; lay a piece of broken pot over the hole at the bottom, cover the bottom an inch or more thick with moss, closely pressed, and upon that an inch thickness of potshards, broken small; place the end of the cuttings upon the potshards, and fill up the pot with clean pit or river sand.

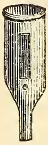
11. When planted, water them well, to settle the sand about the stems; plunge the pots in a gentle bottom heat, either in a hot-bed, or hot-house pit; if in the latter, put a hand or bell-glass over them, shading them from the sun. They will require no more water from the time they are put in until they have taken root.

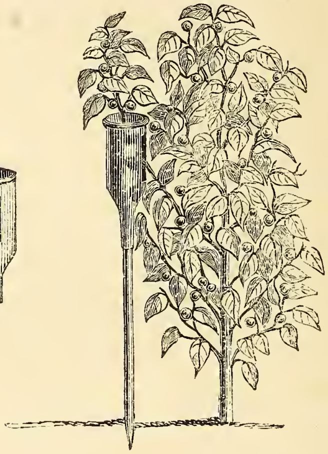
12. When ready for potting, which will be in two or three months, the roots will be found wrapped amongst the moss; they must be carefully separated, allowing as much of the moss to adhere to the roots as possible, for it will tend greatly to prevent the sudden check which cuttings generally receive when first potted. The following compost will be found most suitable for them to be potted in. Turf taken from a light soil, about three inches deep, and laid in a heap till the grass and roots are decayed, peat earth, well rotted dung, leaf mould, and clean pit or river sand, equal quantities, mixing them when wanted for use.

13. When potted, place them in the same, or a similar situation, to that they were in before; give them a gentle watering with a rose watering-pot; and when they have begun to grow, harden them by degrees.

14. LAYERS. Shoots of one or two years' growth may be layered in the usual way, making the incision on the upper side of the branch, and giving it a slight twist, so that the end of the cut part will rest upon the soil. Or these shoots may be bent into pots, either drawn through the holes at bottom, or through the sides, as in Mr. Appleby's propagating pot.

Pots for propagating are certainly advantageous. The benefits of using them are—





The certainty of all the branches making plants.

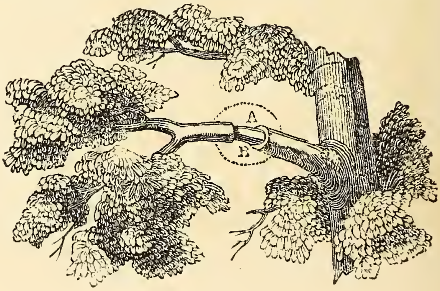
The layered branch grows vigorously whilst rooting, with the superior advantage which pot-layering possesses over the open ground.

The layers, which may now be called *plants*, being already confined in the pot, will only require separating and repotting.

A succession of young plants may be obtained by removing the rooted ones, and replacing the propagating pot to the successional branches.

Mr. Appleby's propagator is made of the same material as the common garden-pot; the upper part is the size and form of a small thirty-two, but about two inches deeper, for holding sufficient water to moisten the earth. A loop-hole is cut through the side, about half-an-inch wide, and an inch and a half long, and about the same distance from the top, through which to admit the layer. To prevent communication between the upper part and the socket, a small hole is made at the base of the pot, immediately under the loop-hole, to let out the superfluous water; the socket, continued from the upper part, is intended to admit a stake, which may be long or short, as the branch to be layered may require. Shoots layered in March or April will be ready to separate in September or October.

A very simple method of propagation, practised by the Chinese, may be very useful in increasing many of our stove and conservatory plants. The system merely consists in selecting a fruit-bearing bough, with a good branchy head, and taking off from the stem a ring of bark, about an inch in length. Around this is placed a quantity of moss, or rich earth and moss, and tied with a coarse cloth, and the whole is kept moist by means of a vessel of water hung over it with a very small hole, or a thread, to convey the water, drop by drop, or by merely using the syringe. The descending pulp being stopped short in its passage downwards towards the root, first forms root buds, which soon send out roots in the moist earth, or moss, and when these are deemed strong enough to feed the plant, the branch is cut off a little below, and the tree in miniature is ready for planting in a pot. The process has been varied by having garden pots made so as to inclose the ring branch, and in this way dwarf fruit trees are often formed on the Continent, where they are much prized.

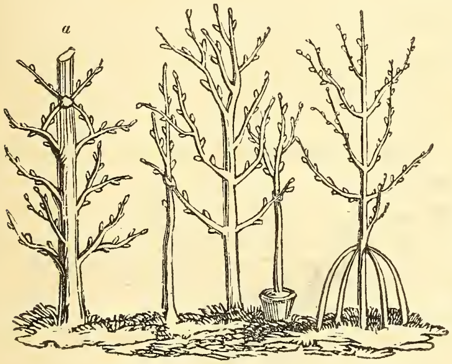


15. **Budding.**—The seedlings, when two years old, are strong enough for budding. This operation is performed in the usual way during the month of August. After budding, place the plants under a hand-glass.

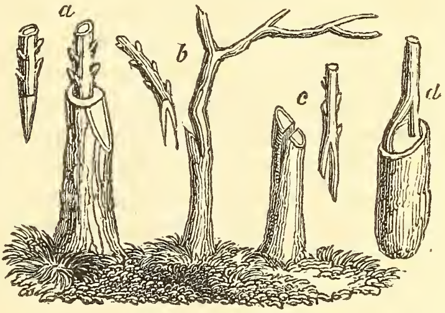
16. In a month after the operation, it will be seen whether the buds have taken, by their plump appearance; untie them, and place them in the greenhouse, where they must remain all winter.

17. In March, head the stocks, for the first time, to about three inches above the buds, and plunge the pots in a hotbed, and by the following August they will have made shoots from a foot and a half to two feet long. Expose them by degrees until they will bear the temperature of the conservatory or greenhouse.

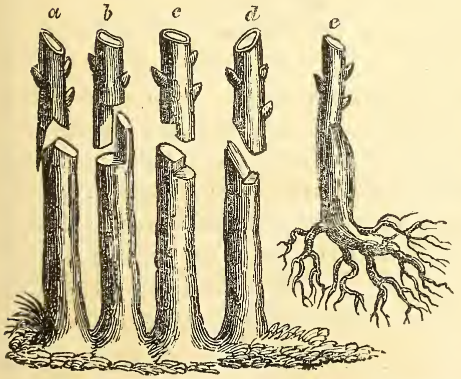
18. **Grafting.**—There are many ways of grafting, all of which are successful if carefully performed. The stocks should be two years old before they are grafted. From the beginning to the middle of April is the best time for whip grafting—March for slit, and many other modes of grafting.



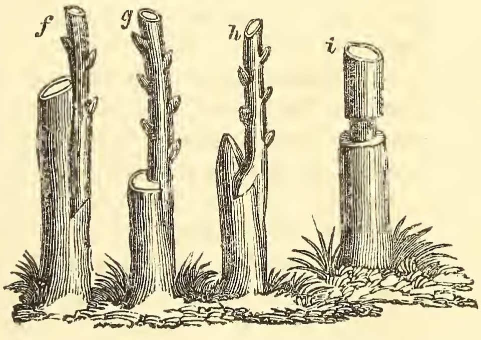
Examples of In-arching.



a, whip grafting with a peg; *b*, side grafting; *c*, whip grafting with a tongue, or tongue grafting; *d*, side grafting.



a, *b*, *c*, *d*, chink, or shoulder grafting; *e*, root grafting.



f, *g*, *h*, French mode of whip grafting; *i*, peg grafting.

19. If the scions appear stunted or dry, or hide-bound, steep them for five or ten minutes in water, made new-milk-warm.

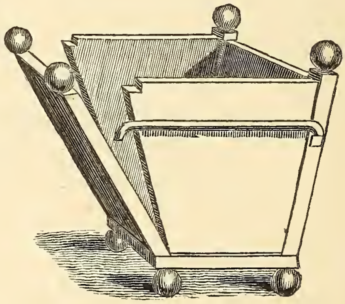
20. After being grafted, place the stocks in a brisk hotbed of dung for about six weeks: during the first fortnight they should be kept close shut up, and be shaded from the effects of the sun, watering, as often as the plants require it, with tepid water.

21. When the grafts are united, which will be in a fortnight or three weeks, take off the bass and clay, and tie a little moss round the part of union; give more air, and continue to slightly shade them for another fortnight, when they will be well united, and may be gradually hardened, and removed to the greenhouse.

22. *Compost.*—The best compost for Oranges, &c. consists of good, rich, turfy, maiden loam, well rotted, one half; very rotten horse-dung, one fourth; very rotten leaf mould, one fourth: mix these well together, but do not sift them.

23. Oranges do not thrive if shifted very often; once in three years is often enough. Lay a good quantity of broken potsherds at the bottom of their pots or boxes; and always, after being shifted, place them in a brisk heat until they have begun to grow again; also syringe them over-head every day in fine weather, and it will greatly facilitate their growth. Top-dressing, however, should be performed every spring.

24. Always select the boxes, pots, or tubs of a proportionate size to the plants. Large tubs should always be so constructed as to be taken easily to pieces when the plants require shifting, or the roots examining. The neatest and most convenient orange-tub is one invented by Mr. M'Intosh, and figured in the *Gard. Mag.*, vol. i. p. 140. It is tapered a little, which gives it a lighter appearance than when made square, and is so very easily taken to pieces, in doing which it is only necessary to pull up the two iron bars, and gently pull out two of the sides, the remaining sides lift up.



25. *Temperature.*—Never allow the air of the house in which Orange trees are grown to sink below 40 deg., nor for the standard heat above 55 deg. Fahrenheit, except at the seasons when they make their shoots and ripen their fruit: in the first case, never allow it to rise above 65, and in the last case not above 75 deg.

26. *Air.*—Always give abundance of air, when the weather will allow; for although the whole genus enjoy humidity, yet, if this be carried to excess, they will become mildewed, and the leaves will become sickly and yellow. In general, it may be taken for a rule, that the more air they receive when in flower, the more fruit will set.

27. The houses in which Orange trees grow should always be light and airy. Although too much violent sunshine is liable, whilst the plants are incapable of

casting much shade, to discolour the leaves, yet darkness is far more injurious than sunshine.

28. *Watering.*—Evergreen shrubs or trees thriving in strong rich soils are seldom fond of much water. The species of Citrus, however, when in large boxes, require a copious supply; and if, during the spring of the year, the plants be regularly syringed, (a practice we follow with good results at Chatsworth), they will grow very vigorously.

29. When the fruit is set, water the trees once a week, with water in which equal parts of the dung of cows and sheep have been steeped, sufficient to render the water as thick as cream.

30. Always allow the soil to have the appearance of dryness before water be administered, when they are not in a growing state, and allow as little moisture to fall on the leaves as possible, until the season of growth commences, which will be about the beginning of March.

31. *Pruning.*—The pruning chiefly required is to cut out those branches which are little worth, to make room for the young fruit-bearing wood, and to thin the whole sufficiently to admit the sun and air. The best time for pruning is just before the trees begin to grow, in February.

It often happens that newly imported Orange trees become bark-bound and sickly soon after they arrive in England. This may arise from such causes as change of climate, difference of soil in which they are potted, suffering drought and the contrary, nature of the stocks, &c. &c. If the plants are not large, the best way is to immerse the stems three parts of the way up, in warm water, for a few hours, previous to potting; after potting, cut in the head according to the strength of the plant, and wrap hay-bands, or something of the kind, round the stem for a while, plunge the pots in a little heat, and syringe both the head and the hay-bands every day until the plants begin to grow, after which the bands may be removed; but the plants had better remain plunged in heat, until they have made some vigorous shoots, after which gradually expose them until they are able to bear the conservatory.

Insects and Diseases.—The red spider, coccus, and a little insect bearing a resemblance to the thrips, often much infest the Orange. The former may be destroyed by syringing with pure water, and occasionally with a little sulphur; the coccus may be destroyed by soap and water, with a sponge; for the last, which eats the pulp of the leaves, and causes them to be much blotched, we have discovered no certain cure: the most effectual remedy we have found is to syringe the trees pretty often with pure water.

Orange trees thrive exceedingly if planted out into a border in a conservatory or greenhouse.

In France, the flowers are thinned for distillation. The thinned fruit is made into confectionaries. In some cases, the fruit will require no thinning. Our large trees at Chatsworth produce so much fruit, that thinning is indispensable.

CULTURE OF THE BLETIA TANKERVILLIÆ.

The *Bletia Tankervilliæ* flowered for the first time in this country, in the stove of Mrs. Hird, at Apperley-bridge, near Bradford, Yorkshire, to whom it had been sent by Dr. Fothergill, her uncle, in 1766. It is very easy of culture, and will flower freely if potted in a soil composed of equal parts of light sandy loam, peat, and river sand. Let the pots be plunged up to the rim in a bark bed, or other brisk heat, during the time the roots are in a growing state, and give a good supply of water. When out of flower, and the roots become dormant, take up the pots and place them in a shady situation; allow the soil to become rather dry, until they begin to grow again: as soon as this is observed, repot them, and plunge as before directed. They are readily propagated by parting the roots, treated in the same way as the flowering plants.

ISMENE AMANCAES SULPHUREA.

NEW SULPHUR-COLOURED ISMENE.

This very ornamental bulb was raised four years ago from a seed of *Ismene Amancaes*, which had been fertilised by the pollen of *Ismene Calathina*. The colour of the flower is greenish yellow, and the scent, though very powerful, is not so delightfully fragrant as in *Calathina*, nor so disagreeable as that of *Amancaes*. The constitution is vigorous, like that of the former species, from which it inherits also a more robust stature, and less attenuated leaves. *Ismene Calathina* thrives vigorously out of doors, in a border of sand and peat mixed, and flowers in July and August, if the bulbs are planted out in April, and taken up when the leaves decay in November or October. The soil being loose and light, it is easy to avoid breaking their strong fleshy fibres, which should not be injured. The bulbs so taken up should be put all together in a large pot or small tub, according to their size and number; and some light soil being poured over them, they should be placed at the back of a greenhouse, or in any shed where they will be preserved from frost, and must have no water. *I. Amancaes* requires a much more sandy soil, and less moisture; If planted out of doors, a large potful of soil should be taken out of the border where it is set, and the hole filled with pure white sand; and unless the summer is very wet it will succeed well. If kept in the greenhouse it should be potted in very sandy compost, and be watered sparingly, and should be left quite dry from the time the leaves decay till May. Peat and too much water have caused many cultivators to lose this plant, which is not difficult to preserve.—Rev. W. Herbert, in *Botanical Register*, 1665, where a beautiful figure of the plant is given.

CULTURE OF THE GLORIOSA SUPERBA.

About the month of January the roots should be potted two inches deep in upright forty-eight pots. The soil used for the purpose should be composed of one-half of loam, one quarter of leaf mould, and one quarter of peat; plunge the pots of roots in a frame or bark bed, where they will receive about eighty degrees of heat; water them very sparingly until the shoots have grown a little. In the beginning of March they should be sifted into a size larger pots, being careful not to break the ball, using the same compost as before; then plunge them in a bark bed or frame, and allow them as much as ninety degrees of heat. When the shoots grow they must be supported by tying them to sticks, or a temporary trellis; by which treatment they will advance upwards of ten feet high, and flower beautifully. When the stalks have died down, remove the pots from the bark bed to a dry part of the house, when they will be entirely free from any droppings of water, as they must have no moisture during the time they remain in a dormant state. They are readily propagated by dividing the roots, or by seeds, which generally ripen very freely.

APOCYNEÆ—GENUS ECHITES.

" E. Stellaris is a tender stove climber, newly introduced from Rio Janeiro to the Horticultural Society by the Hon. Robert Gordon. In the month of August, its flowers perfume the part of the hothouse in which it is placed with a delightful smell of Primroses. It readily grows in peat and loam, but is scarcely to be propagated except by cuttings of the root.—*Botanical Register*, 1664. Its flowers are deep rosy red in the centre, with fine starry lobes, bordered with a sort of orange-yellow, which gives a striking appearance to the flowers."

All the species, with the exception of *bispinosa, succulenta, tuberosa,* and *difformis*, (which are greenhouse plants,) require the heat of the stove. They all grow freely in a mixture of peat and loam, and require nothing particular in their treatment. Cuttings will strike root very readily if planted in sand, or sandy soil, and covered with a hand or bell glass.

CULTURE OF THE GENUS GLADIOLUS.

If the possessor wishes to grow them in pots, the following rules must be attended to:—

1. All the species thrive best when planted in a mixture of very sandy loam, and decayed leaves or peat soil.

2. Like all other bulbs of a similar habit, they require to be kept perfectly free from water during the time they remain dormant.

3. At the end of September, or beginning of October, always take the bulbs out of the pots, and replant them in fresh soil.

4. After being planted in fresh soil, set them in a cool frame, and shelter them from frosts, till they have filled their pots with young roots; then remove them to the greenhouse or other warm situation, to stand for flowering.

Most of the species will succeed, if planted in a border composed of light soil, close under a south wall, especially under the wall of a stove or greenhouse. It is, however, necessary in this case to plant the bulbs six inches, or more, deep, that no ordinary frost can injure them. And during severe weather, they should be covered with a little dry litter or other materials.

They, however, flower the strongest when planted in a pit where they can be covered with lights and mats in frosty weather, and exposed to the air in fine and mild days. They can, also, in such situations, be readily protected from heavy rains by placing on the glasses. This effectually prevents the rotting of the bulbs, which is often the case when they are planted out of doors; but for convenience at the time of flowering, no system equals growing them in pots, because they can be removed to any situation the cultivator may choose.

Occasionally they ripen seeds, by which they may be propagated; but chiefly they are increased by offsets from the bulbs.

NEW LILIACEÆ.

Cyclobothra alba.—" This is a *Californian* bulbous plant, introduced by the Horticultural Society, in whose Transactions it, and the *C. pulchella*, have lately been published by Mr. Bentham. They are probably quite as hardy as tulips, like which they should be treated; unless it should prove that their bulbs are capable of living all the year round in the open ground,—a property we can hardly anticipate, considering how dry and mild a climate is that of California compared with England. In the garden of the Horticultural Society, they have been planted in the open border, in a light loamy soil, in a cold frame, where they grew with considerable vigour, flowered beautifully, and produced abundance of seed."—*Botanical Register.*

Cyclobothra pulchella.—" We doubt whether this plant likes the climate of England so well as the last; for, although it grew with apparently perfect health, flowered freely, and ripened its seed, under the same circumstances as *C. alba*, yet the specimens which were produced could not be compared with the wild ones sent home by Mr. Douglas, for beauty. The latter consist of many-flowered and rather dense corymbs of flowers; but the cultivated plant hardly exceeded *C. alba* in the number of its blossoms."—*Lindl. in Botanical Register.*

CULTURE OF THE GENUS CRINUM.

There has existed considerable difference of opinion as to the distinctive characters of the two genera, *Crinum* and *Amaryllis*. Mr. Gower says, "there is no difference between the true *Crinums* and those placed under *Amaryllis*, except a slight variation in the form of the corolla, and in the inclination of the filaments. The form of the bulb constitutes no essential distinction, as it varies greatly in the acknowledged members of the genus, being spherical, or conical, or cylindrical, or of mixed form. These forms graduate into each other; and in some species the trace of a bulb is hardly to be made out, the leaves diverging at once from the root stock. In *C. erubescens*, which never loses its leaves, the bulb is scarcely to be traced. In *C. Asiaticum*, the poison bulb, and its allies, it is decidedly columnar, and the foliage persistent (not falling off). These inhabit the deep alluvia of rivers, and are exposed to inundation during the periodical rains; and are always sufficiently supplied with moisture to be kept in a state of growth. *Crinum scabrum*, and all its kindred *Amarylloid Crinums*, have true bulbs; and in our collections cannot be preserved in health without a season of absolute rest. Their foliage is deciduous, in many sloughing off completely from the bulb. They inhabit dry ground in their native regions, and are exposed to long periodical returns of great drought, and to the utter loss of their foliage*." From these observations, we gather that all those species, the roots of which are perfect bulbs, and foliage entirely deciduous, must have no water during the time they are dormant, and be watered at all times with care; the soil, although rich, should be light by a mixture of leaf-mould, peat, and sand, and the pots well drained with potshards, and be placed in a situation near the glass, yet in a very hot part of the stove: by this treatment, and keeping them dry when dormant, they will flower very freely, particularly if potted every year in fresh mould previously to their beginning to grow again.

All those species, the bulbs of which grow with a long thick neck, somewhat resembling a leek, as *C. amabile*, the finest species of the genus, and *C. bracteatum*, which, although amongst the smallest, is elegant and very fragrant. *C. pedunculatum*, *C. riparia*, &c. require a great quantity of water during their flowering season, and a moderate portion throughout the remainder of the year. They grow freely in rich mould, with a little sand mixed to keep it from binding; these should be planted in large pots, and plunged in the bark-bed, or placed upon the flue, and if well drained they can scarcely be overwatered, particularly the *C. riparia*, and *C. longifolium*, the former of which was found by Burchell in 1816, in a tract of country in Southern Africa, till then untraversed by any European; "it grew in large bunches on the banks of the Nugareip or Black river, in similar situations to those occupied by the common yellow flag, (*Iris pseud-acorus*); where it is frequently under water, whenever the river rises a little above its ordinary level *;" and the *C. longifolium* in North America, is cultivated as an aquatic, being planted in ponds and reservoirs the same as water-lilies; these are all increased by suckers from the root, or by a kind of bulbiferous seed which they occasionally ripen, particularly the Botany Bay lily (*C. pedunculatum*). When they are shy in throwing up suckers, cutting down near to the root will cause them to produce abundance; indeed, if the bulbs are wounded by any means, the same effects are produced.

---

* Botanical Register, fol. 1049.

OPERATIONS FOR MAY.

AURICULAS when out of flower must be potted about the end of the month, after the manner recommended in page 11. Place those plants intended to produce seed under a south wall as soon as the flowers fade, and give them a good supply of water.

BIENNIALS which have been raised on a slight hotbed may be transplanted in the open borders or pots about the end. See page 66.

CAMELLIAS being now in a growing state require a brisk warmth. See page 33.

CARNATIONS.—About the middle of May sow the seeds; and about the end give the flowering plants a top-dressing of leaf mould and sheep dung. See page 69.

CHRYSANTHEMUM INDICUM.—Pot the best suckers for flowering next season.

DAHLIAS.—Transplant seedlings, as recommended last month, page 67.

ERICA.—Cuttings, plant and treat as recommended last month, page 67.

IPOMOPSIS ELEGANS should be treated as recommended in page 27.

HOLLYHOCKS may be parted at the roots in the beginning of the month.

MIMULUS FLORIBUNDUS, and other annual species, should now be carefully thinned, or they are very apt to damp off. See page 29.

PASSIFLORA KERMESINA, and other species, may be propagated by cuttings in the beginning of the month, page 25.

POLYANTHUSES.—Seedlings will now require transplanting.

ORANGE-TREES may now be grafted.

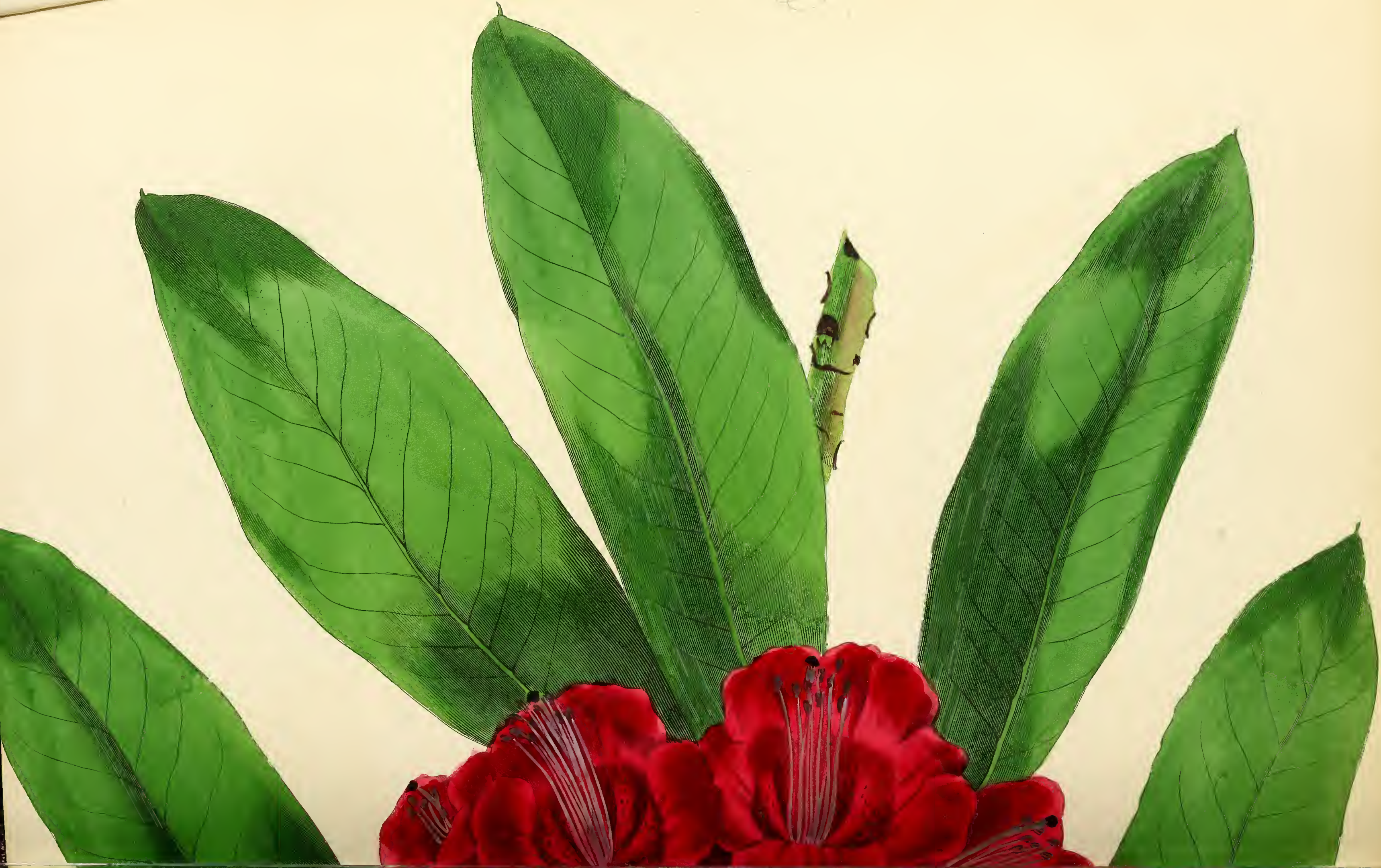
RANUNCULUSES.—Plant early in the month for flowering in August. See page 42.

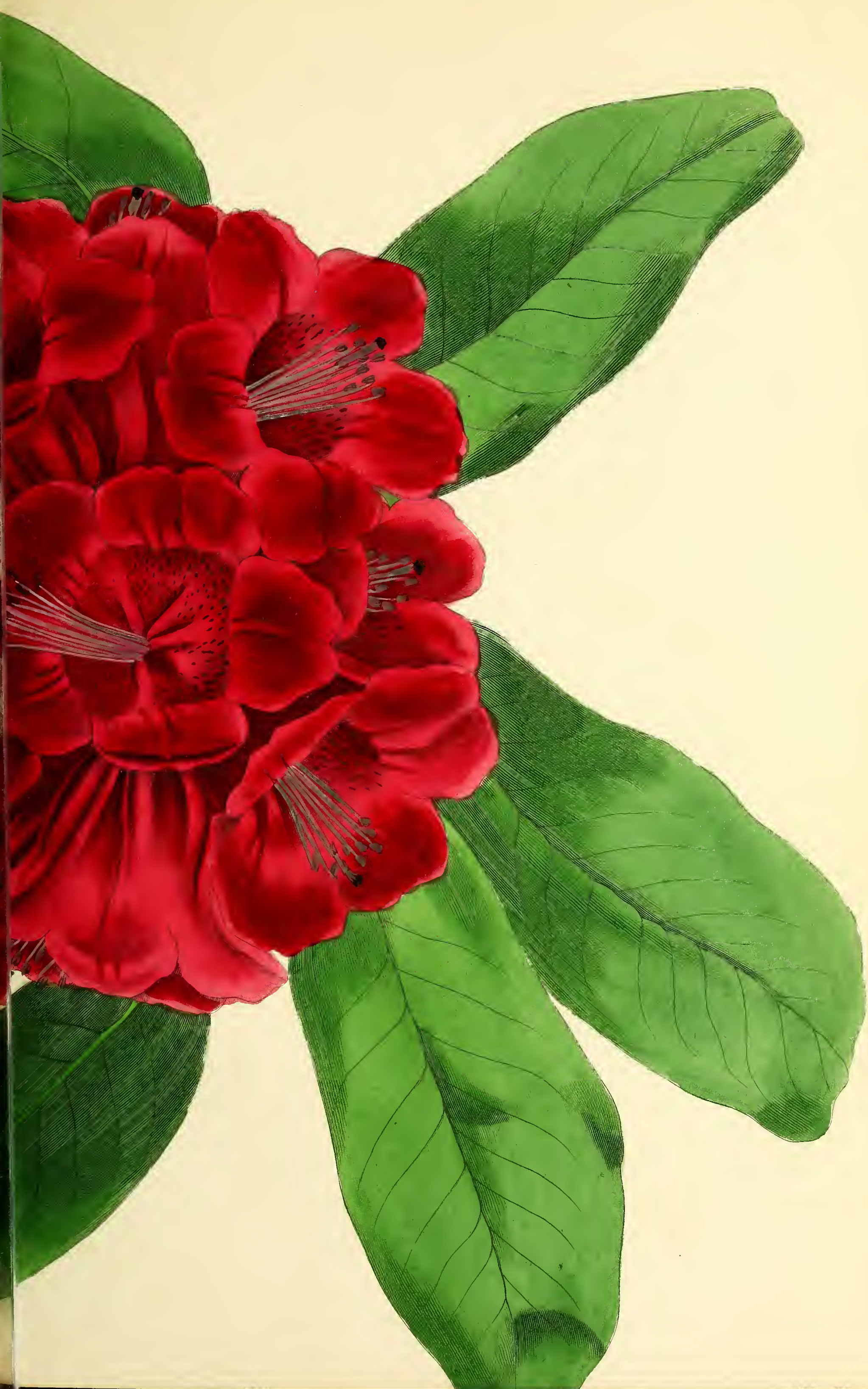
ROSE TREES.—Cuttings of the China and its varieties may now be put in, under a hand-glass, in light soil, on a shady border. The French kinds, which were left unpruned at the usual pruning season, in order to produce late flowers, may be cut as follows:—as soon as the new shoots are an inch long, cut back all the old wood below where the new shoots have pushed.

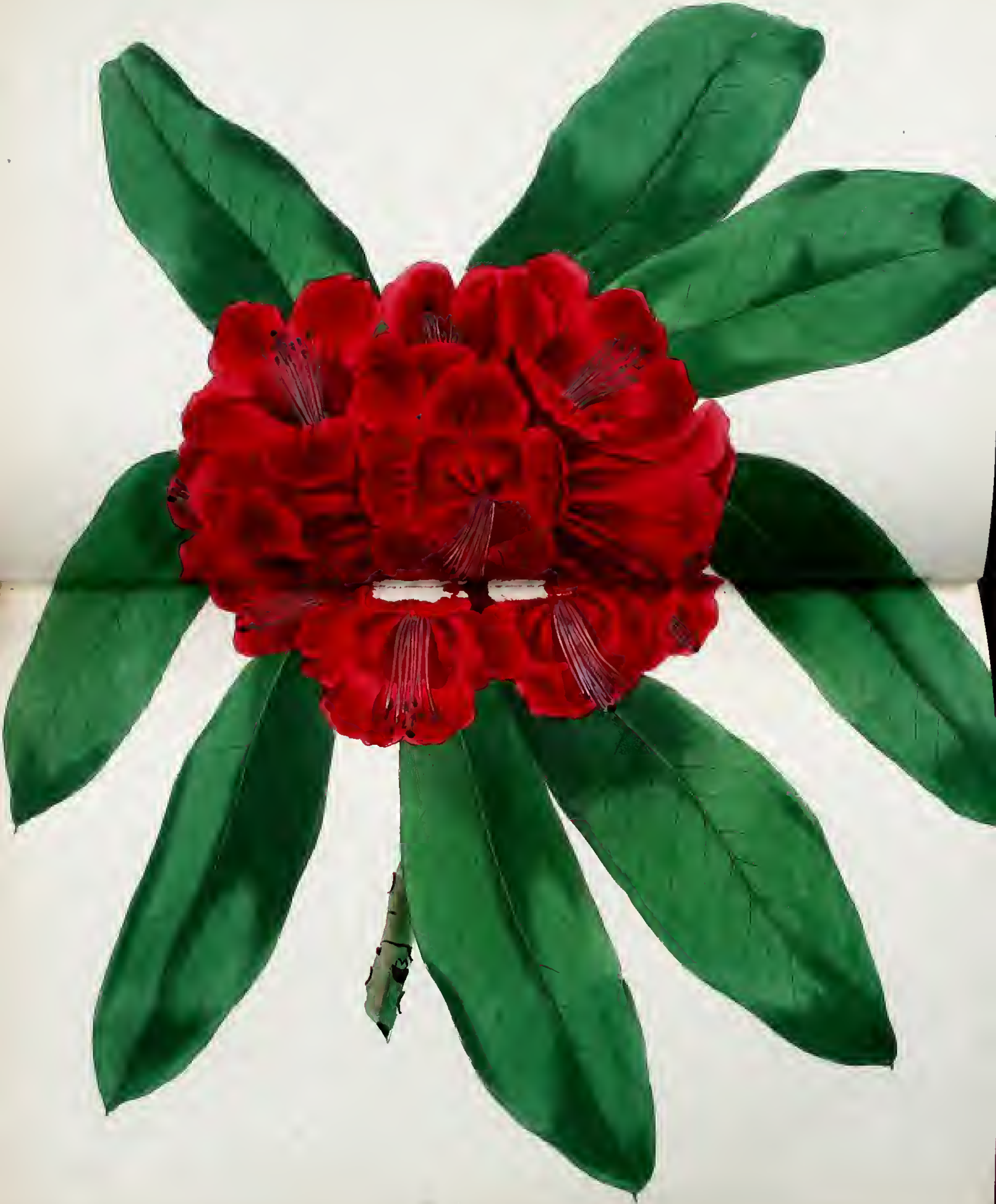
VIOLETS.—Runners may now be collected and planted.

---

* Botanical Register, fol. 546.







Rhododendron arboreum

RHODODENDRON ARBOREUM.

TREE-LIKE RHODODENDRON.

LINNÆAN CLASS.
DECANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
RHODORACEÆ.

Generic Character.—*Calyx* five-cleft, persisting. *Corolla* funnel-shaped, limb in five divisions, spreading. *Stamens* hypogynous, declining; filaments filiform, anthers ovate. *Style* filiform; stigma capitate. *Capsule* five-celled, central column composed of five lobes. *Seeds* thin, linear, having an obvolute membrane.

Specific Character.—Bark rugged, soft, and tuberous. Leaves lanceolate, acute, silvery beneath. Flowers in terminal clusters, campanulate. Calyxes woolly.

This is by far the most magnificent of all the rhododendrons hitherto discovered. Its tree-like stature, handsome form, ample foliage, and gorgeous heads of deep red or crimson flowers, render it one of the most ornamental and desirable of exotics. It requires a place in the greenhouse or conservatory, not being hardy enough to bear our winters like its congeners from North America; though hopes are entertained that, after a few more years' partial exposure to the climate of Britain, and when the oldest plants gain a more moderate growth and hardier habit, they, or some of their progeny, may be able to resist ordinary frosts.

The botanical world are indebted to the indefatigable Dr. Wallich for the introduction of this and, we believe, of three other species of rhododendron, from the lately explored country of Nepal. How delighted that gentleman must have been on his first view of this splendid tree! It was an acquisition which well rewarded his personal toil and trouble, in his anxious search for the botanical riches of that almost unknown part of the world. Nor was this his only acquisition; many other new and fine plants were discovered, described, and figured, in his splendid folio work, "Plantæ Rariores Asiaticæ," published in 1830.

Our present subject, like the rest of this highly ornamental family, succeed best in turfy peat-earth, and may be propagated by layers. Luckily, with proper care, it occasionally ripens seeds, which with us vegetate readily. It was introduced in 1820; the white variety of it, we believe, a year or two before. Since then, several of its alliances have been received from the continent, as well as direct from India, both by seeds and plants, particularly that fine species the *R. campanulata*.

JUSTITIA COCCINEA.

SCARLET JUSTITIA.

CLASS.
DIANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
ACANTHACEÆ.

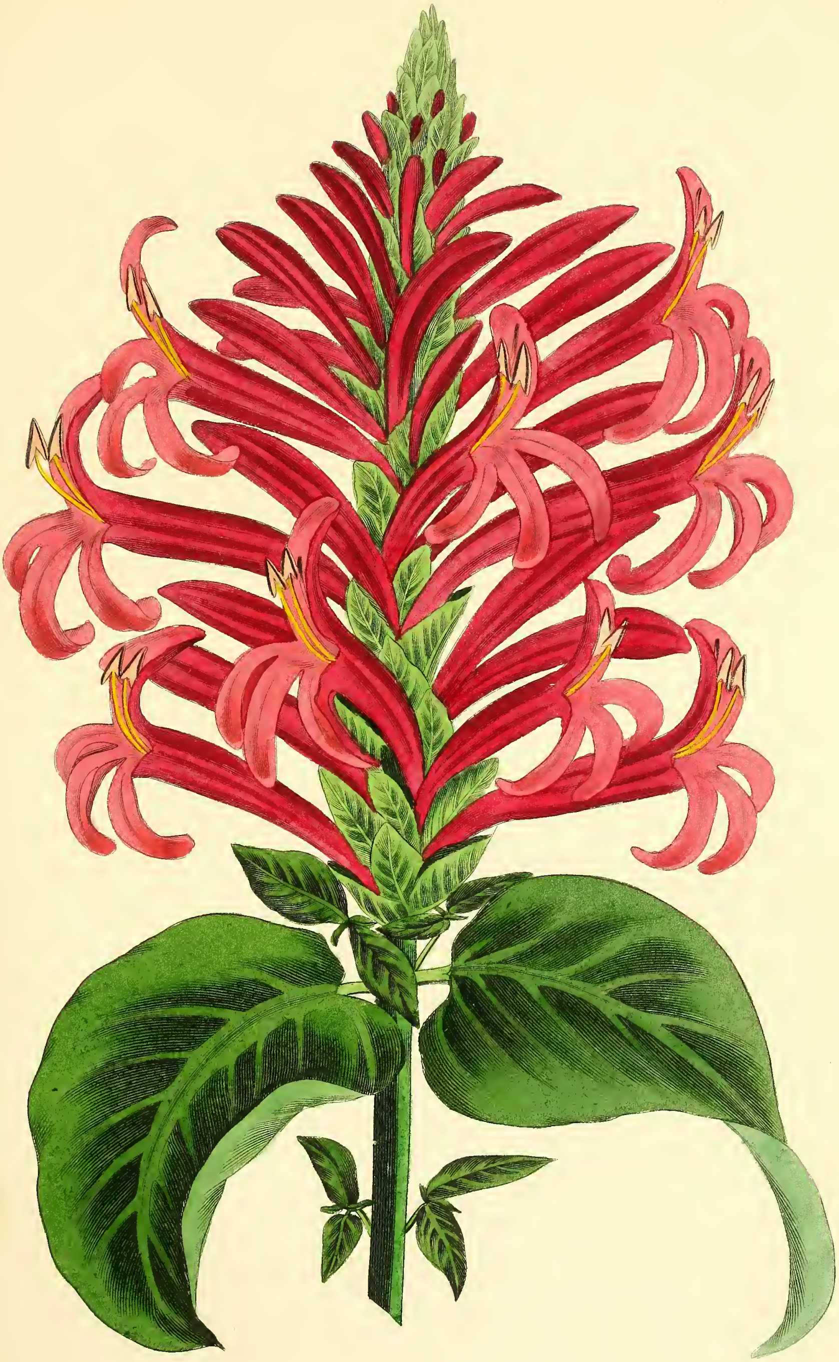
Generic Character.—*Corolla* gaping or two-lipped, the lower lip divided. *Anthers* two-celled. *Capsule* two-celled. Seed fixed by small hooks.

Specific Character.—Stem shrubby; leaves ovate, smooth, entire, glossy, dark green; spike terminal; corolla two-lipped, upper one entire, lower one three parted; bright scarlet colour, very showy.

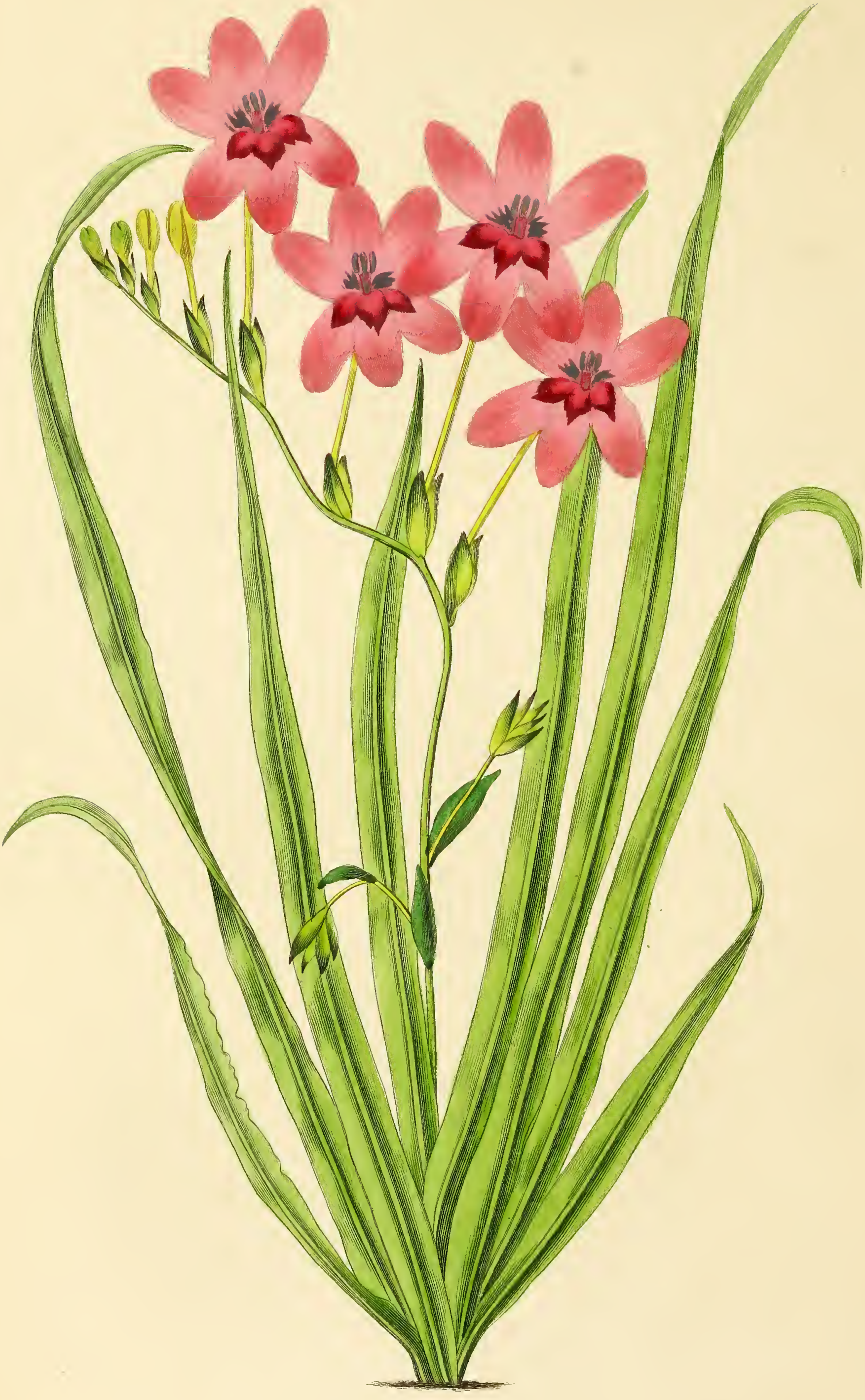
The present plant is an old inhabitant of our stoves, being introduced as early as 1770. It makes a very splendid show when in flower, the richness of its scarlet appearing very conspicuous. This as well as all the other stove species thrive well in a mixture of peat and loam.

All the shrubby species are propagated very readily by cuttings, taken off when the wood is half ripe, and planted in pots filled with either light soil or sand, and plunged in a gentle heat under a hand-glass.

The name is given in honour of J. Justice Esq., an eminent Scotch Botanist, who published several works on Gardening about 1754—63.



Justicia coccinea.



Anomatheca cruenta.

NF 834

ANOMATHECA CRUENTA (Lindl.).

BLOOD-SPOTTED ANOMATHECA.

CLASS.	ORDER.
TRIANDRIA.	MONOGYNIA.

NATURAL ORDER.

IRIDEÆ.

Generic Character.—*Spathe* two-valved. *Flower* six-parted, coloured, salver-shaped. *Calyx* and corolla not distinct. *Stigmas* three. *Capsule* covered with numerous warts, having something the appearance of being covered with frost.

Specific Character.—Bulb ovate; leaves from four to eight, somewhat narrow, yellowish green, smooth, slender, occasionally slightly waved, about half as long as the flower-stem; stem from four to eighteen inches high, round, having three or four branches proceeding from it. Flowers from four to ten on each branch; tube of the flower from three to four times the length of the spathe, and nearly twice as long as the limb, the segments of which are a rich carmine colour; each of the three lower have also a rich dark blood-coloured spot at their base, which adds in no small degree to the beauty of the flower; capsule thickly covered with protuberances of a dark green colour. Seeds shining, rich brown colour, in shape not unlike those of mustard, but larger.

This plant is a native of the Cape of Good Hope, from whence it was introduced in 1830. Our plants flower very freely in the greenhouse, from April to July or August, and when placed in the stove, they come into flower in February; they also thrive very well planted in a vine border, or close under the front wall of a stove. The best sort of soil, is a mixture of sandy peat and loam, in proportion of one fourth of the latter to three fourths of the former. When planted out of doors, the bulbs require to be set a good depth, say four inches, and if not taken up at the commencement of winter, throw a little dry litter over them, or turn a pot over them filled with sawdust; but it is advisable, when convenient, always to take them up about the end of October, and preserve them like other bulbs until April, when they may be planted again. When planted in pots, it is not necessary that the bulbs should be taken up, but when they have done flowering, cease to give them water gradually, until the plants have become totally dormant; keep them during this time perfectly dry, or they will rot, or otherwise receive material injury.

It is readily increased by seeds, which it produces in great abundance, and by separating the bulbs at the time of potting in January or February. At this time the bulbs will begin to make a new start, turn them out of the pots, separate them entirely from the old soil, take off all the offsets, and again replant them in entire new mould; water them cautiously until they begin to grow, after which they may have a good supply and they will flower very freely.

Its generic name is given in consequence of the singular frosted appearance of the seed-vessel. The specific name from the colour of the flowers.

CULTURE OF DAHLIAS.

All the new and splendid varieties which now make so great show in our gardens, have been raised from seed. To ensure success to the cultivator the following rules may be found advantageous :—

1. Artificial impregnation is certainly an advantage, and, if properly performed, will seldom fail to answer the intended purpose ; the greater part raised at Chatsworth, under these circumstances, have proved excellent flowers.

2. Select as handsome and compact flowering plants for the parents as possible. Having done so, with a small pointed camel's hair pencil, take the pollen dust from one flower to another. The design of this, however, would in a great measure be frustrated, if bees were not prevented having access to the flowers.

3. To prevent any disappointment from bees, cover the flowers intended to be the female parent, with a fine gauze bag, for two or three days before the florets expand, as recommended in the Horticultural Register, page 145.

4. As soon as the florets open, impregnate them, but retain the gauze bag over them for another week, until all danger of impregnation from bees is over.

5. In collecting the seed in autumn, most cultivators collect from the outside tiers alone, because they are usually much finer and better ripened. These outside tiers, however, are probably inferior to the inside, for producing the greatest quantity of double flowers, the very finest seeds usually producing the greatest number of single flowers. We would therefore advise to collect both inside and outside tiers.

6. February is the best time for sowing the seed. Fill some pots or boxes with light sandy loam and leaf mould, or leaf mould alone, and thinly scatter the seeds, lightly cover them with the same soil finely rubbed through the hands upon them, and place the pots in a gentle hotbed, or other convenient place where the seeds will receive warmth, and they will shortly be up.

7. As soon as they come into rough leaf, which will be about the end of March, transplant them, two inches apart, into other pots or boxes filled with the same compost in which they were sown. About the middle of April they will again require transplanting.

8. In transplanting this second time, either place them in single pots filled with a mixture of good rich loam, leaf mould, and rotten dung, or plant them in a gentle hotbed, in the same kind of soil. The former is the best way, although attended with most trouble, because the plants can remain in the pots until they are turned out entire into the borders, when all danger of frost is over.

9. Keep them still in a gentle heat, and gradually expose them to the open air, until they will bear it regularly in the day, but take them in when there is the least danger of frost at night.

10. When all danger of frost is over, they may be turned out with good balls into the situations where they are intended to flower.

11. They will grow well in any good garden soil, but if it be a good strong rich loam, they will flower earlier and better; also the colours will be more brilliant. Much dung, however, must not be introduced into light soils for them, or they will make a great quantity of branches, and probably not flower till late in the year, when the frosts are just commencing. But if the soil be suitable, they will flower about the end of July.

12. *Old roots.* To forward their flowering plunge them in a gentle heat, either in a hotbed, or other convenience, making use of either old bark, leaves, or saw-dust. This should be done in the beginning of February. The heat of the hotbed must not be great, or the roots will be liable to rot.

13. When the young shoots have pushed about four inches long, take the roots out of the bark, &c., in which they were plunged, and pot them; but previous to potting, if the roots can be separated, now is the best time to do it. Always leave about two shoots to each piece of root so taken off; all superfluous shoots should be cut off close to the root to form cuttings.

14. Pot each of the roots separate as above in a rich light loam, the size of the pots must be regulated according to the size of the roots.

15. If it is not convenient to push the roots early, they will do very well planted at once in the open ground; and when the young shoots have pushed about four or six inches long, take them all off except one or two, and plant the shoots so taken off as cuttings.

16. Root-grafting is very advantageous, when the sorts are very choice and the cuttings very weak, as when raised from grafts they are fit for planting out in half the time of cuttings. Roots of any inferior sorts will answer well for stocks; when the cuttings of the sorts to be propagated are in readiness, break off single tubers, and with a sharp knife slit them for two inches downwards from the top, making the incision on one side only, cutting about half way through, then cut the scion somewhat wedge-shaped, and insert it in the incision of the tuber; and after having bound the root round with good bass mat, pot them in 60-sized pots, and treat them as cuttings.

17. In obtaining cuttings, splitting or cutting off close to the root is far preferable to cutting them through a joint in any other part of the shoot. The best sized pots for planting cuttings in are sixties, placing one cutting in each pot.

18. Fill the pots for cuttings with a light sandy soil. After being planted plunge them in a hotbed, and give very little water; in sunny weather shade them, until they are perfectly established, which will be in about a fortnight after planting.

19. When they are rooted remove them to a cold frame, or other shelter, where they can receive plenty of air, and about the beginning of May, they may be regularly exposed to the air, except in case of frost, when they must be protected.

20. About the end of May or beginning of June, when all danger of frost is over, they may be turned out into the situations where they are intended to flower;

this may be either in the flower border, or on an open quarter to themselves. It is necessary that the situation be sheltered from winds, and yet fully exposed to the influence of the sun.

21. If they are planted on a quarter, they must be placed from three to six feet apart, according to their size; but if on the borders, no rule can be fixed, but the situation must be left to the option of the cultivator.

22. The soil in which they flower best is a good rich loam, rather strong than otherwise. Therefore if the soil is naturally bad, it is necessary to open holes two feet deep and wide, and fill them with a good compost for the reception of the plants.

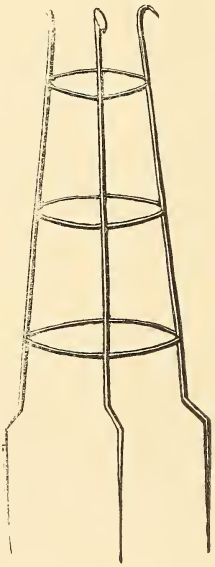
23. It is very advantageous to change the situations every year, but this is not indispensable, as they will flower with great vigour in the same situation for many years.

24. Never plant the roots very shallow, but rather deep than otherwise.

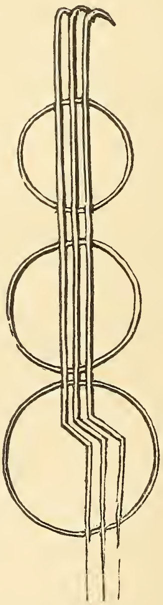
25. If the weather should be dry after they are planted, give them a good watering once a week with some liquid manure or soapsuds, which will greatly facilitate their growth.

26. Never allow above two stems to proceed from the root. As they branch out from the bottom take them off; the plants, by these means, will flower much finer than if they are allowed to remain.

a



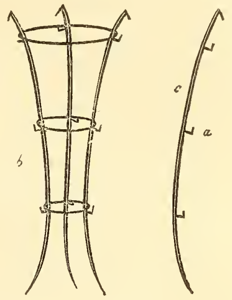
b



27. Staking is indispensable, or they will soon be broken by the wind. This may be securely done, by driving three stakes in a triangular form, round the plant, to which securely tie all the branches; or they may be trained to a fence with advantage; but probably the best means of support is by iron stands. The one manufactured and sold by Mr. Murphy of Dublin, one of the Editors of the "Irish Farmers' and Gardeners' Magazine," has met with a very great sale. The uprights are made of $\frac{5}{8}$ round iron, and stand four feet above the surface of the ground. The hoops are $\frac{3}{8}$ round iron, and pass through holes punched in the uprights. The figure (*a*) represents the stand as fixed in the ground, and figure (*b*) shows the manner of placing it when not in use.

Another very neat one, the design of which was sent to us by Mr. Saul, of Lancaster, looks very neat, and answers the purpose very well. It may be obtained at a very trifling expense, as it requires no labour in making after the uprights are cast. It merely consists of three half-inch uprights, each of which has three small hooks (*a*), to support the hoops when set as (*b*). If the diameter of the hoops were twelve inches the top one, eight the middle one, and five the lower one, it would require to make them about seven feet of quarter-inch iron. Again, supposing one of the uprights, (*c*) to be five feet long, and half an inch thick, each stand being formed of three uprights, would take fifteen feet long of half-inch iron. But if the hoops measured in diameter eighteen inches, twelve inches, and nine inches, they would require about eleven feet long of quarter-inch iron. The whole cost of each, except workmanship, would scarcely exceed eighteen pence.

28. When the flower buds appear, thin out all the small and weakly ones, if fine flowers are wanted; but if they are merely to ornament the flower border, this is not necessary.



29. When the blooming season is near to its close, lay about three or four inches thickness of rotten bark or leaf mould over the roots, and for two feet round the stem of each plant; this is done to prevent the crown of the plant from being damaged by sharp and sudden frosts.

30. Always select, if possible, a dry windy day for taking up the roots; shake the soil carefully from them, so as not to twist the roots.

31. As soon as they are cut down by frost take them up, and remove them to an airy situation in a shed, or mushroom-house; and there place singly over the floor or shelves, till the soil remaining on the roots is dry.

32. When perfectly dry lay them on shelves secure from damp or frost; and cover them either with dry sand, sifted tan, or other material of this kind, and they will keep perfectly sound.

CRITERION OF A GOOD DOUBLE DAHLIA. "The flower should be fully double, always filling the centre; the florets entire or nearly so, pointed or rounded, reflexed and so forming a globular head, regular in the disposition, each series overlapping the other backwards: they may be either plain or quilled, but never distorted; if, instead of being reflexed the florets are recurved, the flower will be equally symmetrical. The peduncles ought to be sufficiently strong to keep the blossoms erect, and consequently well exposed to view, and long enough to show the flowers free of the leaves; if they are a little pendulous in the taller growing sorts, they will have a more elegant appearance. The plant ought to flower early and abundantly, and retain its characters until the end of the season. Colours bright and velvety are most admired."—*Hort. Trans.*, Vol. 7. Part 1.

CULTURE OF ROCKETS.

The usual method of propagating rockets is, by dividing the roots when they have gone out of flower and have begun again to grow; but the following few simple rules, which have long been followed with the very best success, will be found very far superior.

1. When the plants have done flowering, which will be about the end of July, cut down the stems to the ground or nearly so, and they will soon make abundance of new shoots from the root; and this will be greatly facilitated if the soil be stirred about them, or a little drawn round their roots, and in dry weather a good supply of water be given with a rose watering pot as often as they require it.

2. Prepare a bed in a warm situation of light sandy loam and leaf mould, and after having well levelled it previous to the insertion of the cuttings, give the whole a good watering.

3. When the shoots have become about two inches high, select the strongest and slip them off from the root in preference to using a knife in separating them; trim off the lower leaves, and plant them in the prepared bed, in rows six inches apart and three inches from cutting to cutting. After a short time again make a selection of the finest, until a sufficient number of cuttings are put to supply the ground intended to be occupied by them.

4. When the cuttings are planted, spring a few hoops over the bed, and by means of mats or other light covering, shade them from the effects of the sun, until they have begun to strike roots, after which remove all shade, and when they have become fine plants remove them with good balls to the situations they are intended to occupy in the borders.

CULTURE OF THE POLYANTHUS (PRIMULA VULGARIS).

1. All polyanthuses should, if possible, be grown in a free pure air; for want of this they rarely flourish in the immediate neighbourhood of large towns. They may, it is true, be kept somewhat clean, by occasionally sprinkling clear water over them, but if this be continued to any extent, the plants will most likely perish.

2. The soil in which they should be grown should be composed of one half good rich maiden loam, one fourth rotten cow-dung or horse dung, and one fourth leaf mould.

3. All the more delicate or fine sorts should be grown in pots, and sheltered from the beginning of October to the end of April, in a frame or pit, as recommended for auriculas, p. 9, rule 3.

4. Previous to placing them in the frame, top-dress them with a little new compost, and so place them in the pit as that they shall scarcely exceed one foot distance from the glass, or wooden shutters.

5. In this situation give them as much air as possible, but always shelter from

rains, until they begin to grow in the spring. They seldom suffer so much from frosts as auriculas, but to insure a good bloom in the spring it is best to give them sufficient shelter.

6. Always pot them immediately after the flowering season, that is, about the end of May or beginning of June, except such as are to produce seed; follow the directions given for auriculas, in p. 11, rule 11.

7. Throughout winter keep them rather dry than otherwise, as recommended for auriculas; and when they begin to throw up their flower stems, expose them now and then to gentle showers, as recommended for auriculas, p. 10, rules 4 & 5.

8. In February, or never later than the beginning of March, the plants must be top-dressed with the same soil in which they are recommended to be grown; remove for the purpose an inch or more of the old soil from the surface.

9. As soon as the buds have formed, thin out all the inside ones, and leave only about six, never more than ten, of those on the outside to expand.

10. When the flowers begin to expand, and, indeed, some time previous to this, the buds must be shaded from the effects of the sun and rains, by boards precisely of the same nature as those figured, p. 10, and described, rule 8.

11. When the flowering season is over, remove the plants to an airy but somewhat sheltered situation in the garden, and allow them to remain there until they have ripened their seeds.

12. Gather the seed as soon as the seed-vessels begin to change colour, and sow it immediately in pans or feeders filled with the same compost as that in which the plants are potted; proceed in precisely the same manner with sowing and transplanting, as recommended p. 11, rules 9 & 10.

13. In potting, always give a good drainage, and also break off the old bottom carrot-like stumpy root, retaining that part only which has plenty of young fibres; breaking it off is always preferable to cutting, as the metal, for reasons unknown to us, appears to have a very injurious effect on the plants.

14. When potted, water them pretty freely, to settle the soil, place them in a shady but airy situation. This shade is indispensable, for if not attended to the plants will shortly suffer.

15. Remove all the large offsets in March or April, because they grow quickest in Spring; if they are small when planted they will be very liable to die.

16. After being potted, water them well, and place them in a shady situation where they can have plenty of pure air. They should not be watered again until they show signs of having formed roots.

17. Always select seed from the most compact and best flowers, as Parks' Lord Nelson, &c. &c.

18. If it is not convenient to grow them in pots, after taking off the offsets in Spring, plant them in a shady border on an east or west aspect, and water them plentifully until they strike root.

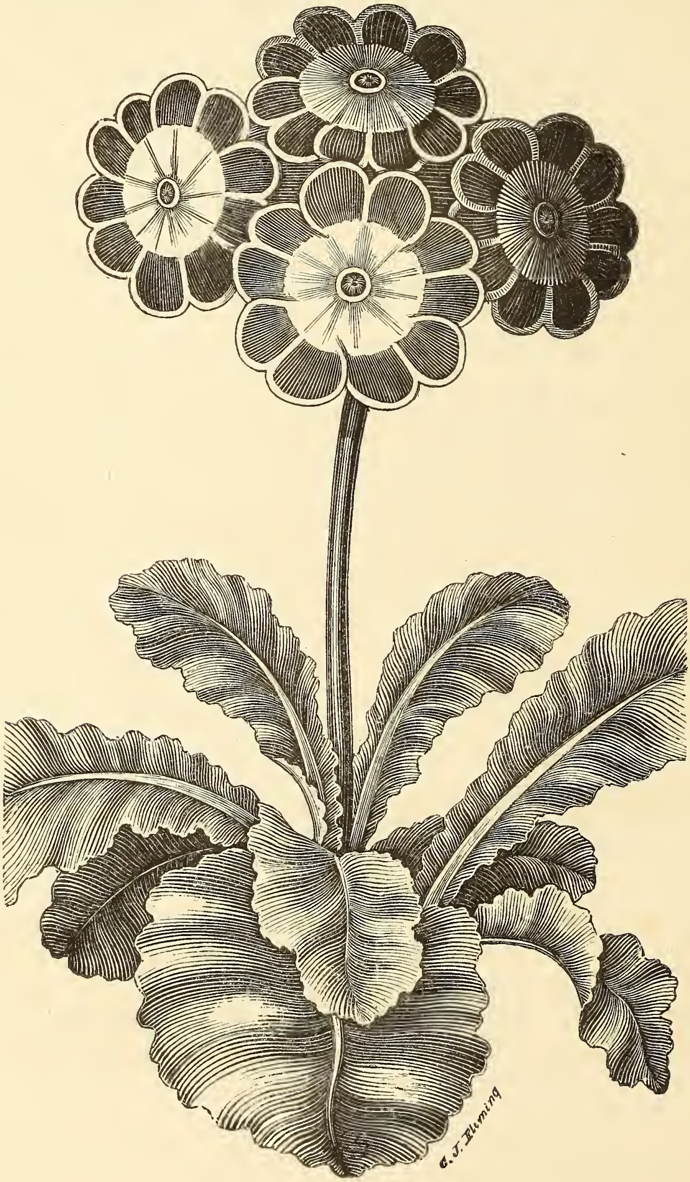
19. Always make the beds for their reception something higher than the surrounding ground, and always shade the plants upon them from excessive rains.

20. Plant so deep in the soil that the leaves will lie close upon the ground and the new roots which grow from the upper part of the stem, will run into it, and add greatly to the vigour of the plants.

21. Great care is requisite to secure the plants from the depredations of slugs and other crawling enemies.

22. If they are infested with the green fly, sprinkle a little weak tobacco water over them.

If the flowers when expanded do not lie flat and even, use the instrument figured page 11, in the same manner as there recommended for auriculas.



The proportions of a good polyanthus are nearly the same as those of auricula, but the outline should be more circular; the eye must be perfectly round, the ground a dark rich crimson, or scarlet velvet, which must be in proportion to the size of the pips; the edge a bright gold line, clearly and distinctly marked down to the eye, which must also be a clear bright yellow.

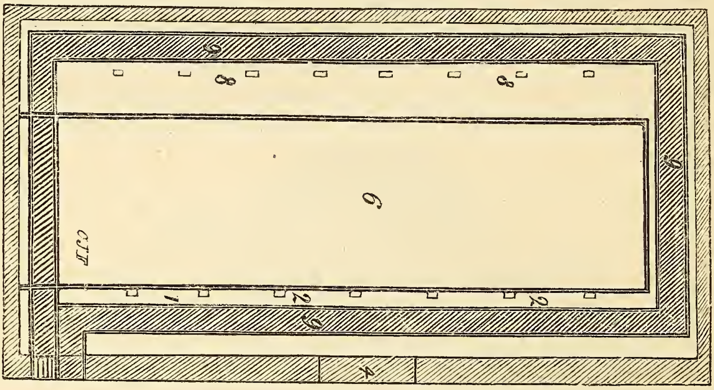
The following is a selection of the most popular flowers, furnished us by Mr. Revell of Sheffield; and although numbers of seedlings are raised every year, many thousands may be raised before these can be surpassed, particularly Pearson's Alexander, George the Fourth (figure), Formosa, Crownshaw's Invincible, Cox's Prince Regent, &c. &c.

	Seedling Pans.	CLASSES.								Total.
		1	2	3	4	5	6	7	8	
Pearson's Alexander	7	13	3	4	1	..	..	..	..	28
Cox's Prince Regent	1	3	3	4	2	..	2	1	1	17
Buck's George IV.	2	3	3	3	2	..	1	1	..	15
Collier's Princess Royal	1	4	2	..	2	2	1	..	..	12
Clegg's Lord Crew	..	..	2	1	2	3	2	..	..	10
Nicholson's Bang Europe	1	1	3	1	2	1	..	..	..	9
Eckersley's Jolly Dragoon	..	1	2	2	1	2	..	..	..	8
Turner's Princess	..	..	2	1	2	..	1	2	..	8
Sir Sydney Smith	..	1	..	2	2	..	1	..	..	6
Crownshaw's Invincible	1	..	1	2	1	1	..	..	..	6
Fletcher's Defiance	..	..	..	..	3	2	..	..	..	5
Waterhouse's George IV.	..	1	1	..	1	..	..	..	..	3
Lord John Russell	1	1	..	1	1	..	..	..	..	4
Beauty of Coron	..	1	..	1	..	..	1	..	..	3
Biddle's Elizabeth	1	1	..	..	..	..	..	..	..	2
Clegg's Commander	1	..	..	..	..	1	..	..	..	2
Revell's Buckingham	..	..		..	..	..	..	..	..	1
Rock's Mary Ann	1	..	..	..	..	..	..	..	..	1
Chilwell Hero	..	1	..	..	..	..	..	..	..	1
Revell's Othello	..	1	..	..	..	..	..	..	..	1
Buck's Huntsman	..	1	..	..	..	..	..	..	..	1
Burn's Formosa	1	..	..	..	..	..	..	..	..	1

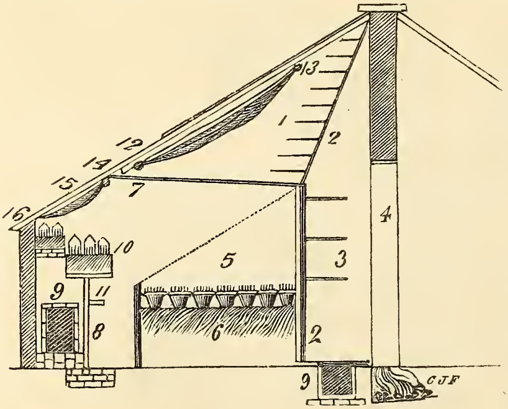
PLAN AND DESCRIPTION OF A HOUSE FOR STRIKING CUTTINGS.

AT THE NURSERY OF MR. RONALDS, BRENTFORD.

Almost all the plants with which we are acquainted, may be increased by cuttings; and in order to perform this successfully, two things are requisite to be known, the best time to take the cuttings from the plants, and the best manner of keeping them alive until nature has formed roots to support them. It would be impossible to lay down any rule for the first, without making an entire list of all the plants known, as every genus, and even species, differs more or less from another; for instance, the common tree pœony, *Pœonia Moutan*, will root in six weeks, if the cuttings are put in soon after the plants are out of blow; whilst the sweet-scented variety will only strike when planted previous to the flower expanding.



The house built by Mr. Ronalds has been found to answer the purpose of a cutting-house very well. The front stage is used for plants which will not bear the damp atmosphere of the pit, as *Epacris*, *Ericas*, &c., &c.; the pit is for the cuttings of such plants as require a damp atmosphere, as *Camellias*, *Phillyreas*, and many other evergreens, which require a little heat to make them root freely. When well rooted, remove them to another house, and make room for more on the shelves. The pots for cuttings cannot be too well drained; they should be half filled with broken potshards, and these covered over with a little rough peat or moss, which will keep the sand from sinking through.



At the back of the pit there are iron supports, one inch square, each one solid bar, and bent as (2,) into which brackets are rivetted for the shelves to rest upon (3); the shelves are used for bulbous or tuberous rooted plants in winter, as *Ferrarias*, *Dahlias*, *Gladioluses*, *&c.*; these extend the whole length of the house; there is a door through the back wall (4), to take any plants in the potting shed, without exposing them to the open air; the two bottom shelves are divided, and take out easily when the pots of cuttings in the pit may require moving, to introduce new tan into the pit, or for other purposes. The pots of cuttings (5), are placed on the tan (6), and not plunged, as by constant sprinkling they are liable to become too wet; eighteen inches thick of new tan is put on the bed, about every two months; this keeps up a regular warmth; the new tan is suffered to lay on the old for the two months without mixing, then some of the old tan is taken away, and the whole mixed well together, at the same time spreading over the top eighteen inches more of new bark. The lights which cover the pit are attached by a loop, or string and nail, to the rafters of the house (7), at the time of sprinkling the cuttings with water. The front stage is supported by frames of one-inch square iron (8), set firm in three or four covers of brick work, and also driven into the wall of the house. One of these frames is placed at about every three feet; (9) flue; (10) beds of sand, with pots and glasses fitted in them; there are three pieces of wood, one-and-a-half inch square, laid at the bottom of each bed to support two flat tiles, on which the sand is laid; a board is also screwed to the turn-up iron to keep the sand up in front; the pots of cuttings are then plunged, by which means they are not so liable to suffer from either drought or constant watering, and the flue being underneath, gives a moderate warmth, and keeps the cuttings in a growing state through most part of the winter; a bracket is rivetted into each iron support (11), to bear a shelf, for the purpose of setting on the cutting glasses when not wanted, or at the time of sprinkling the cuttings. The pit is shaded by a covering of very thin canvass, three feet wide, which can be rolled up or spread out at pleasure, by means of a wooden roller (12). The canvass is attached to a lath, and by means of pulling a string tied to the lath, and passed through a ring (13), the canvass is stretched out as wide as the ring; the string is then fastened to a nail (14), to keep the canvass in its place. When the string is loosed from the nail, the canvass may be rolled upon the roller by the hand; (15) roller for shading the front pots in a similar manner, the lath is placed on a hook at (16), which keeps the blind extended, and is rolled up or spread out by the hand.

The above was furnished us by Mr. Ronalds himself, some time ago, and was noticed in the Horticultural Register, vol. i. p. 626; the plan we admire and consider very complete, and the success attending its use, argues that it answers the purpose exceedingly well.

ON THE PROPAGATION OF CAPE HEATHS,

AS PRACTISED AT WOBURN ABBEY, AND DETAILED BY MR FORBES IN HIS EXCELLENT WORK, "HORTUS WOBURNENSIS."

Cape Heaths being of much shorter duration than most other Cape plants, it is necessary to have constant recourse to propagation, in order to keep up the collection, which should be increased by cuttings and seeds; the latter forming the only means of procuring new varieties, should be both introduced direct from the Cape, and saved from those plants that perfect their seeds in the heathery, or greenhouse in this country, collected as they ripen, and general sowing made in the ensuing February, or March. The pots intended for the seeds should be filled about half full with the drainage, and the remaining space with the soil, which should be intermixed so as it may consist of half peat, and half sand, finely sifted, for the depositing of the seeds, and rendered perfectly level, when the seeds may be sown, but observing not to bury them too deep in the soil; a very slight covering will be quite sufficient. In short, if they are merely covered, it will be all that is necessary. After the seeds are committed to the soil, they should have a gentle sprinkling of water to settle the soil about them, which must always be given to the seed-pot, by a very fine rose on the watering-pot. The seed-pots should then be placed in a cool frame, where they can be shaded from the mid-day sun, and the soil in the pots kept in a moist and vegetating state, and when they make their appearance through the soil; a little air ought to be given, which will prevent the young plants from being drawn up weakly, and damping off. When the seedling plants have obtained the height of two or three inches, they should be put into small sized pots, in the same soil as was mentioned for the sowing of the seeds in; five or six plants may be placed round the edges of each pot, which should be again replaced in the frame, and kept shaded, until they begin to strike root in the fresh soil, when they may be gradually exposed to the sun and air; and after they appear to have got well rooted, and are growing freely, they should be put out singly into small sized pots, with as much of the soil attached to the young fibres as possible. When the plants are young, they will require to be frequently shifted; but this operation must be regulated according to their growth, and as they fill their pots with young roots.

But the most general method of increasing the Heath in this country, is, by propagating from cuttings of the young shoots, which should be taken off when the wood becomes of a firm texture, when it will not be so liable to be injured by damp, as it is frequently the case when put into the cutting pot in a tender state. The best season for putting in heath cuttings is from March to July; but the operator must be guided in this by the state of the shoots which are intended for this purpose. In fact, most of the species will strike root if put in at any period of the year, provided the cuttings are taken off when in a fit state. To procure shoots of the less free growing sorts, they may assisted by placing the plants in a little artificial heat, at the early part of the season, which will be the means of furnishing good cuttings, when they should be carefully stripped of their leaves to about half the length of the cutting, with a sharp knife or scissors, and the end cut clean across; they will then be ready for inserting into the cuttings pot, that should be previously prepared, and filled within a couple of inches of the rim with the drainage; and then have a layer of the fibrous parts of the soil placed over the crocks, when the remaining space should be filled up with sharp pit sand, well washed, and cleared from all earthy matter, &c. The sand should, lastly, be well watered, and made perfectly firm and level, when it will be fit for the reception of the cuttings, which should not be inserted deeper in the sand than is necessary for the fixture of them, to avoid being displaced in the watering, which should be liberally supplied while they are striking root.

Many of the sorts will have formed good roots in the course of eight or ten weeks, whilst others will require as many months. In Autumn and Spring, the cuttings should be placed in a shaded part of the stove; but, in the Summer season, they will succeed equally well in a cold frame, shaded from the mid-day sun. Mr. Muirhead, a very successful propagator of the Ericeæ, formerly plunged his pots in coal-ashes, behind a north-wall. in the Summer season, where they were covered with hand-glasses, and removed in Autumn to the Pine-stove. The cuttings will, in general, strike root more readily by being covered with bell-glasses, the size of which must be regulated by the pots, and be occasionally wiped, when there appears an accumulation of moisture on their inner surface; but these glasses may consist of those with holes in their tops, which will permit the moisture to evaporate, and prevent it, in a great measure, from injuring the cuttings. Mr. M'Nab, however, and the Messrs. Loddidges, both consider these glasses unnecessary, except for a few sorts. When the cuttings begin to grow freely, it is generally a sure sign of their having made roots; they should then be taken carefully out, and put into the smallest sized pots that are made, placing four or five round the sides of each, and then placed under a hand-glass, and shaded, until they begin to make young roots in the fresh soil, when they may be gradually exposed to the sun and air; and when they appear to be of sufficient strength, and their roots well established in the soil, they should be planted singly into small pots, and afterwards treated in every respect the same as was mentioned for the seedlings. The culture of the Ericea is rendered more easy by their being seldom attacked with insects; the green fly will occasionally infest some of the plants, but it is easily eradicated by fumigation, or by dipping the infected shoots into a decoction of tobacco-water; some of the species are, also, subject to mildew; but this is likewise readily subdued, by dusting a little sulphur over the affected parts; the most effectual preventive for the disease, however, is a free circulation of air amongst the plants.

CULTURE OF THE GENUS VIOLA.

This genus contains more than a hundred species and varieties, the greater part of which are ornamental and deserving of notice. They are chiefly hardy, and will thrive in a mixture of peat and loam; and, with a few exceptions they are very low-growing plants. The tender species are, *V. arborescens, decumbens, humilis, cæspitosa, pygmæa, betonicæfolia,* and *Broussonetiana.* These may all be treated as half-hardy plants; and all, with the exception of *arborescens,* may be propagated by division of the roots. The *V. arborescens* may be either increased by cuttings or layers. The best time to put in the cuttings is as early in the spring as they can be obtained, generally in March. They are easily struck if planted in a light rich sandy soil, and covered with a hand-glass in a shady part of the greenhouse. The *V. odorata* and its varieties are well known, and appreciated in our gardens for the delightful fragrance they emit. The great point amongst gardeners is to have these throughout the winter ; for this purpose a double variety, called the *Neapolitan* is evidently the best. The old blue violets seldom force well, but the other may be had in perfection all through the winter with very little trouble. The culture may be stated as follows :—

1. The first thing to be attended to, is to obtain as early a crop of runners for planting out as possible ; the growth of these may be much forwarded by sifting a little light soil, or vegetable mould, over the old plants, as soon as they have done flowering, and by watering them with a rose watering-pot.

2. When sufficiently rooted, which will be about the end of May, take them off the old plants, and prick them out in a bed of light loam, or loam and peat, without any manure. Make the bed in an airy, but somewhat shaded situation, and place the plants in rows six inches apart, and four inches from plant to plant in the rows. Keep them perfectly free from weeds, and water them if necessary ; and by the end of July, they will be ready to plant into the flowering beds.

3. Make a bed for them to flower in as follows :—Take out the old soil six inches or more deep, and fill the opening with a mixture in the following proportions. One barrowful of light sandy and one barrowful of rotten cowdung, to every two barrowsful of sandy peat.

4. When the bed has properly settled, take up the plants on the nursery beds with good balls, and plant them in rows, six inches apart every way.

5. They will now require no further attention than occasionally watering, and keeping them free from weeds. When the nights begin to be cold, place a frame over them, and put on the lights at night, and in very rough weather ; also preserve from the effects of frost by covering with mats, and they will be in flower in December, and will continue flowering till February.

6. In some cases it may be wished to grow them in pots, for the windows, during winter ; for this purpose pot them in August, and, if convenient, set them in a hot-bed frame as they are wanted to come in flower ; but if this cannot be done, they will flower very well placed in the window of a warm room.

The *Viola tricolor* has now become a flower of much repute amongst florists, many of the varieties having remarkably large flowers of very brilliant colours. It is called *Heart's Ease*, *Pansy*, and various other names, and is well known amongst our lady gardeners. Their mode of culture is as follows.—

7. Always sow the seed within a month after being gathered, except it be gathered after September ; in which case it must not be sown till the following April, unless it be sown in pots or boxes.

8. Make the bed, on which to sow the seed, of light sandy soil, in a shady situation ; lay just as much finely sifted soil on the seed as will cover it ; then gently pat it down with the back of a spade, to causs the soil and seed to adhere to each other a little.

9. In ten days or a fortnight the plants will be up; when an inch high, transplant them into beds, placing them in rows, four inches apart every way.

10. As this is the bed on which they are intended to flower, always select a somewhat moist situation, but yet well drained; and if not naturally so, drain it for the purpose. And the plants will flower the following spring.

11. All valuable sorts may be propagated by cuttings. These, to be successful, should not be put in later than the beginning of June; for if left later, their flower-stems become hollow and pithy.

12. Plant the cuttings either in thimble pots filled with light sandy soil and well rotted dung, or on a shady border under a hand-glass. If they are planted in pots, set them in a cold frame, and give them a little shade until they have struck root.

13. *Layers.*—In May or June make a slight incision in the joint, as for other layers, and peg them down about an inch or less in the soil.

14. *Division.*—They may be divided almost any time throughout the summer, but it is requisite that this be always done in moist and dull weather.

15. Never make the beds on which they are to be planted higher than the surrounding surface which would render the soil too dry for their successful growth.

16. To ensure a fine show of flowers, it is necessary to renew these plants every year. Old plants invariably produce smaller flowers.

PROPERTIES OF A GOOD HEART'S EASE.—The flower-stem must be of a sufficient height and strength to raise the flower above the foliage of the plant; the petals of the flower large, flat, and without notch or fringe on the edge. The colours must be clear, brilliant, and permanent. The eye should be small compared with the size of the flower.

CULTURE OF THE NARCISSUS.

1. ALL the species of this genus thrive in light sandy soil, and the greater part force well either in pots of soil, or glasses of water.

2. Although the greater part are well known inhabitants of our flower borders, and constitute one of its greatest ornaments, yet the more choice sorts are usually grown in beds by themselves.

3. Make the beds in an open airy situation; take out the old soil to the depth of six inches, and fill up the vacancy with a mixture of equal parts of good rich loam, leaf mould and rotten dung, with a small portion of sand to keep it open. Raise the bed four inches above the surrounding surface; and when it has settled, it will stand about two inches higher than the surrounding surface.

4. The best time to plant the bulbs is in November; select a dry day for the purpose, and plant them three inches deep, in rows six inches apart every way.

5. Never allow the roots either in the beds or borders to remain more than three years, without being taken up and replanted, at the same time separating the offsets.

6. The most proper season for doing this, either in the borders or beds, is as soon as the tops have died down, which will happen some time in July.

7. Always select a fine dry day for taking up the bulbs; spread them on a mat in the sun to dry, for a few days, after which remove them to a cold shed, and spread them on the floor or other convenient place, (in preference to putting them in bags) until the planting season.

8. Separate all the offsets, and treat them precisely the same as the old bulbs.

9. *Propagation by seeds.*—Gather the seeds as soon as they are ripe, and sow them in pans or pots filled with light maiden soil; place them in a situation not too much exposed to the sun until the end of September.

10. At the end of September, set them in a frame, and screen them from heavy rains and frost; allow them as much light as possible all winter, and by the end of March they will be up.

11. About the end of May, when the frosts are over, take them out of the frame, and place them under an east wall during the summer.

12. When the leaves are dead, give the pots a top-dressing with fresh soil, and treat them through the second winter, as recommended for the first.

13. At the end of the second summer, turn them out of the pots, and plant them in beds of light sandy soil, about two and a half inches apart.

14. After they have stood two years in this bed, replant them six inches apart in another bed, composed of equal parts of strong rich loam, leaf mould, and rotten cow-dung: here they will come into flower, after which they may be treated as the old bulbs.

After a careful examination of the numerous species of this genius, A. H. Haworth, Esq. has divided them into sixteen genera, which he has named as follows:—

1. *Corbularia* (*corbula*, a little basket,) contains ten species, the hoop-petticoat family, as *Bulbocodium*, *Albicans*, &c. &c.

2. *Ajax* (the brave Greek in the Trojan war;) the Daffodil family, as *Pseudo-Narcissus*, *bicolor*, &c. &c.; twenty-four species.

3. *Oileus* (poets' lesser *Ajax;*) the Clipt-trunk family, as *Abscissus*, *hex angularis*, &c.; five species.

4. *Assaracus* (brother of *Ganymedes;*) two species, the *Capax*, *and reflexus.*

5. *Illus* (another brother of *Ganymedes;*) two species, the *Cernuus*, and *triandrus.*

6. *Ganymedes* (cup-bearer to the gods;) five species, the *pulchellus*, *concolor*, &c.

7. *Diomedes*, (a valiant Greek at the siege of Troy;) three species, *Macleayi* of the Botan. Mag. being one of them.

8. *Tros* (the father of *Ganymedes;*) two species, as *Galanthifolius*, &c.

9. *Queltia* (Nicholas *Le Quelt;*) seven species, the *Aurantia*, &c.

10. Schizanthes (*schizo* to cut, *anthe* a flower, the crown gashed,) one species, the orientalis.

11. Philogyne (*phileo* to love, *gyne* a woman;) nine species, the *odorus*, *campernelli*, &c. &c.

12. Jonquilla (*Juncus*, a rush, because the leaves resemble rushes;) four species, the Jonquils of our gardens.

13. Chloraster (*Chloros* green, *aster* a star, flowers green;) two species.

14. *Hermione* (daughter of Menelaus and Helena,) fifty-four species, the Polyanthus Narcissus family.

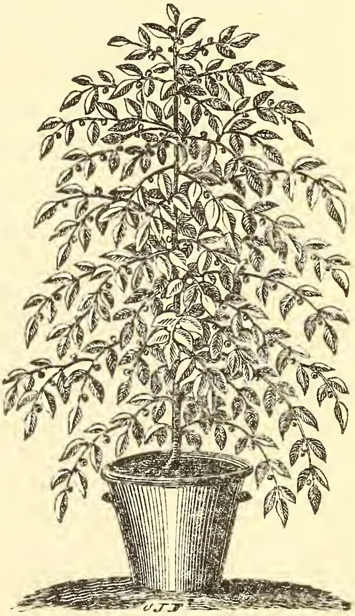
15. *Helena* (the daughter of Leda, and mother of Hermione;) six species, the *gracilis*, *tenuior*, &c. &c.

16. *Narcissus*, twelve species, the *poetarum*, *ornatus*, &c. &c.

CULTURE OF THE GUAVA* (PSIDIUM CATTLEYANUM).

AMONGST the numerous exotic plants in our out-houses, not many have a greater claim on our attention than the Guava (*Psidium Cattleyanum*). Not only is its dark shining foliage and pendulous branches a great ornament to our stove or green-house, but its fruit, when fully matured, makes an agreeable variety in the dessert. By keeping a few plants in pots, they will in two or three years bear a great quantity of fruit. Young plants must be first planted in small pots, and then into larger, as the small ones become filled with roots; at length they should be planted in large tubs or pots, where they may remain for many years without further removal, when they will not fail to produce abundance of fruit. By confining their roots in pots or tubs, the fruitfulness of the trees is promoted. To ripen the fruit well off, it is advisable, in the autumn, to introduce two or three plants at a time into a forcing house, where the temperature is not less than 60 degrees Fahr.

The guava flourishes best in a rich loamy soil; it should be copiously supplied, both at the roots and over the top, with water. By this treatment, a succession of ripe fruit may be obtained in the winter season.



---

* Hort. Reg.

CULTURE OF THE GENUS BANKSIA.

1. The soil most suitable for them is equal parts of peat and light loam, with a small portion of sand. Mix these ingredients well together, and break them fine, but do not sift them.

2. In potting, always be careful to give a good drainage; filling not less than one-fourth of the pots with broken potsherds, and on the top of these lay a little rough turfy soil, to prevent the upper soil from falling amongst them, and stopping the passage of the water.

3. Never allow them to suffer for want of water, for their roots by this means will become so seriously injured, that they scarcely ever thoroughly recover if this is the case. They also suffer greatly, if too much water be administered, but when the drainage is good, the injury is seldom so serious as from drought.

4. During the time they stand in the green-house, do not allow them to be crowded by other plants, neither suffer them to be much shaded; but in summer, when they are placed out of doors, allow them to stand in a shady situation, where they can only receive the morning and evening sun.

5. Whilst out of doors, be careful that no worms effect an entrance into the pots; to prevent this, always place a board or slate for each pot to stand upon, but should any find their way in, once or twice watering with clear lime-water will destroy them.

6. If the weather is very wet, they must be set in a pit, or frame, or airy green-house during the summer months, as the wet would very likely destroy them.

7. *Propagation by Seeds.* Sow them in pots filled with the same kind of soil in which the plants are potted.

8. The best time to sow the seed is April; cover them a quarter of an inch deep, give them a gentle watering, and place them in the greenhouse. If they are not up by the end of May, place the pots close under a south wall, and cover them with a little moss to keep the soil moist, and occasionally water them, and if the seed be not very old, they will soon make their appearance. But in some cases they do not appear till autumn, therefore it is well not to be in a hurry to empty the pots in which the seed is sown.

9. As soon after they are up as they can be transplanted, put them into small pots, one in each, for if allowed to grow to much size, removing is apt to kill them.

10. After potting, place them in a somewhat shady part of the greenhouse, until they have begun to grow, when they may be treated like old plants.

11. *Propagation by Cuttings.* No stated time can be be given for putting in the cuttings. To have success, ripened wood must be made use of. Take off the

cuttings at a joint, two or three inches long, take off the leaf from the bottom joint, when it is to be inserted in the pot, but let the other leaves remain unmutilated.

12. When the cuttings are prepared, plant them very shallow in pots of sand; place the pots on a board or something of the kind, and place a hand-glass over them. Never either set them on a moist bottom, or plunge them, or they will most likely damp off.

13. As soon as they are rooted, pot them off in small sixty-sized pots, filled with the same soil the old plants are potted in.

14. When potted, place them again under a hand-glass or two, or in a cold frame, but they must stand on a dry bottom, or they will soon perish .When they have begun to grow, expose them by degrees, until they will bear to be treated like old plants.

BUTOMEÆ (GENUS LIMNOCHARIS).

LIMNOCHARIS HUMBOLDTI. Humboldt's Limnocharis. New aquatic stove plants are almost as uncommon as new hardy evergreens. Generally plants of this description are very beautiful, either in their flower or their foliage, or remarkable for the singular manner in which nature has enabled them to pass their lives amidst the water. Unless provided with floating apparatus, the small quantity of air contained in their leaves would be insufficient to support them on the surface of the water and they would sink and drown like animals themselves.

But to prevent this occurrence we always find some curious and beautiful contrivance, such as a distension of the leaf stalk, till it assumes a swollen and gouty aspect; or the construction of myriads of air chambers in the solid stem itself; or the roots distended in vegetable swimming bladders; or, as is the case with this species, some special alteration in other parts, which consists in the midrib of the leaf being so enlarged and filled with air, as to render it impossible for the leaf to sink, although loaded with thrice the weight it has to carry; not, however, all the midrib, but only the under-side of it, by which means any upsetting of the leaf, or application of the breathing side (which is the upper) to the surface of the water, by which it would be smothered, is effectually prevented.

This plant was originally found by Humboldt in marshes to the west of Caraccas; but it seems common over all the east side of South America.

The flowers are very fugitive, opening in the morning, and withering up in the course of the day. The petals are extremely transparent and delicate; but the chief beauty of the species resides in the rich purple fringe of barren stamens which surrounds the fertile ones. It flowers all round the year in a tank in the stove.—*Bot. Reg.*

CAPPARIDEÆ (Genus Cleome).

Cleome dendroides. Tree-like Cleome. Though the colour of the flowers is rather singular than brilliant, this is a very striking plant, with its curious candelabrum-like flower-spike, and handsome foliage. It was raised from seeds imported in 1828, from the Brazils, by Mrs. Penfold of the Achada. For the first two years, it has quite the appearance of an annual or biennial herbaceous plant; rising with a single erect stem to the height of from one to two or three feet, and producing, in the summer of the second year, a single terminal spike of purple flowers. But after this, it puts forth one or two branches below the first spike, and the stems become more woody, brown, and decidedly shrubby; yet even in this state, the plant attains no greater height than four or five feet, has seldom above two or three straggling branches at a time, (the rest dying away,) and rather bears the aspect of an herbaceous plant, become by accident perennial, than of a really shrubby one; and, in fact, it rarely lasts altogether more than four or five years.—*Bot. Mag.*

The shrubby species of Cleome thrive best in a rich light soil, and ripened cuttings root freely under a hand glass in a moderate heat; but as most of the species seed freely, this will be unnecessary. The seeds of the annual species require to be sown on a hot-bed frame, early in the spring; and when the plants are of sufficient size they should be planted out into the open border, but this should never be done before the middle of May. The biennial species require to be kept in the stove: cuttings of these will strike root freely under a hand-glass, in a moderate heat.

VIOLA.

Violarieæ, genus viola. Almost every species of violet deserves to be cultivated in gardens, the greater part for the beauty of their flowers, and others for their scent, such as the varieties of *Viola odorata.* The hardy perennial species are well adapted for ornamenting rock work, or the front of flower borders, but the smaller species should be grown in small pots, in a mixture of loam, peat, and plenty of sand.

The American species do best in vegetable mould or peat; those species which are natives of woods are well adapted for growing under trees, and those natives of bogs or marshes should be planted in moist situations.

They are all readily increased by seeds or parting the plants at the roots. The *annual* species may be sown in the open borders or on rock work. The green-house and stove species should be grown in a mixture of loam and peat; the herbaceous kinds of them should be increased by dividing at the root or by seeds, and the shrubby kinds should be propagated by cuttings, which will root freely if planted under a hand-glass; those of the stove species in heat. The frame species should always be preserved in pots, that they may be protected during winter with a frame.

The *Neapolitan violet,* a variety of *V. odorata,* forces well, and where there is a stove, or warm pit, may be had in flower throughout the winter and early part of spring.—*Don's Miller's Dict.*

OPERATIONS FOR JUNE.

Auriculas, with the exception of those which are to produce seed, must now be potted. The proper sized pot for a good flowering plant is ten inches deep, and eight inches wide at the top. (inside measure). Good drainage of broken pot is indispensible, see page 11, rules 11 and 12.

Biennials which have been raised on a slight hotbed, may be transplanted in the open borders or pots in the beginning, if not done done last month, see p. 66.

Camellias that have been subjected to heat, if they have perfected their flower buds, must gradually be exposed to more cold until by the end of the month they may be set out of doors in a shady situation. See page 33, rules 7, 8, and 9.

Carnations.—In the beginning of the month give the flowering plants in pots a top-dressing, see page 103, rule 20.

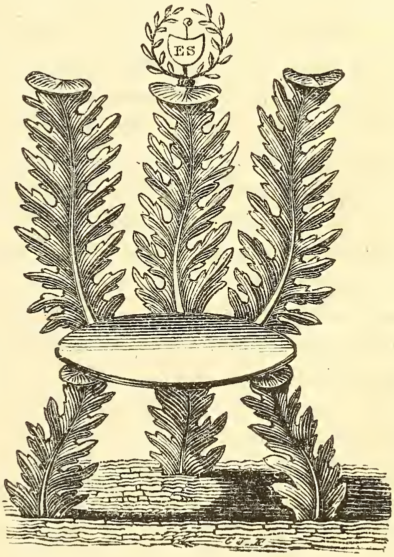
Calceolaria Fothergilli, Corymbosa, &c.—And some others may now be propagated by cuttings put in sandy peat and covered with a bell or hand-glass.

Dahlias, brought forward either in pots or by other means, and roots which have not been started at all may be planted in the open border in the beginning of the month, see page .

Erica cuttings may be put in as recommended p. 67.

Greenhouse Plants generally may be turned out of doors in the beginning of the month. The situation must be sheltered from all cutting winds, and where the plants will not be exposed to the full rays of the sun. After the greenhouse plants are removed fill the house with tender annuals, &c.

The Garden should be furnished in different shady situations with rustic and ornamental chairs or other seats, from which to sit and view the beauties of nature and art. A figure of one sent to us by Mr. Saul some time ago, and given in the Horticultural Register, page 462, would no doubt have a very good effect either on a grassplot or under a tree. This seat is supported by three or more large leaves, according to the taste of the proprietor, and the back is formed of a similar number. A shield may be placed in the centre one, (as E. S.) upon which the initials of the owner might be engraved. The whole is formed of hard wood at but little expense.



Hyacinths must now be taken up if not done before; and when the soil on the bulbs is dry, the bulbs must be cleaned and wrapped either in paper or placed in drawers as recommended for ranunculuses, page 44, rule 10.

Pelargoniums.—Continue to strike cuttings, either placing from 4 to 6 in a 32 sized pot, or, which is much better, placing each cutting in a single thimble pot filled with light sandy loam and leaf mould. Plunge the pots in a gentle hot bed, and keep the frame as close as possible until they have begun to grow; water and shade as they may require it. When struck, pot them in 60 sized pots, and treat them after the same manner as old plants.

Polyanthuses now require re-potting, in the same way as auriculas, only the soil need not be so rich.

Pinks.—About the middle of the month commence putting in pipings, see page 67.

Orange trees.—Cuttings put in about the beginning of March and treated as recommended, page 90, will require potting, see page 90, rules 6—13.

Rose Trees may now be budded; cuttings of the China and its varieties put in as recommended last month, and the shoots of French and English kinds intended for late flowering, shortened as recommended page 100.

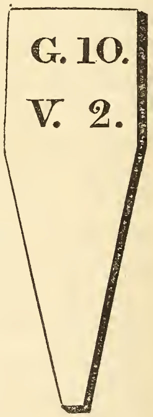
Rose Acacias.—Those intended for late flowering, should have their shoots shortened as recommended for roses, which should be done in the beginning of the month.

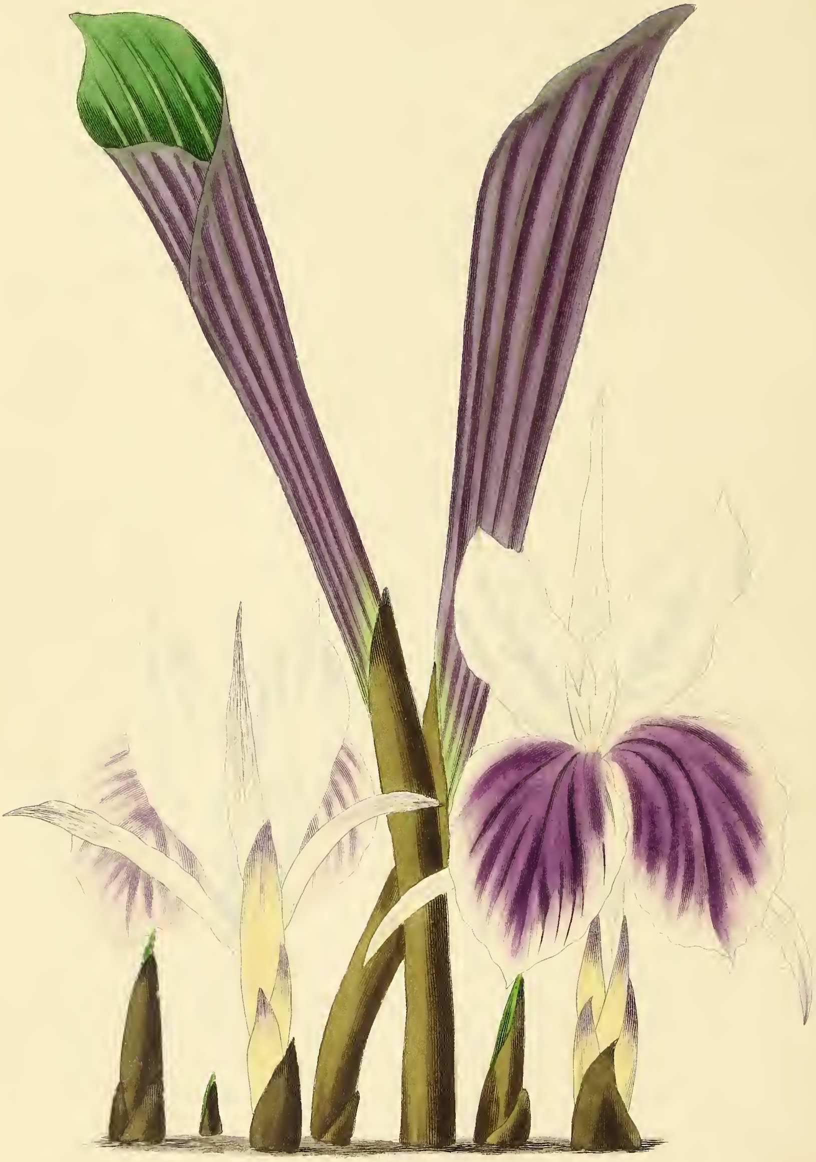
Ranunculuses now planted will bloom in September, see page 45, rule 13.

Rockets may now have their roots divided for propagation, or cuttings will make the best plants, if properly put in, see page 108.

Violets.—Collect the runners and plant them.

Labels for Plants. A simple, durable and inexpensive label for plants in pots, is the one noticed by one of our correspondents to the Horticultural Register, and figured in vol. ii. page 127. It has long been known and made use of amongst gardeners, and merely consists of a piece of lead about two inches long, and sloped nearly to a point from three quarters of an inch in diameter, or larger, according to the size of the pot into which it is intended to be fixed. They are marked by means of steel types about four inches long, having a letter or figure at the bottom of each; this is placed upon the lead and an impression is made by the blow of a hammer. The labels will cost about one shilling per hundred, and the types will cost about sixpence each.





Kæmpferia rotunda.

JUNE 1834

KÆMPFEIRIA ROTUNDA.

(ROUND-ROOTED GALANGALE.)

CLASS.
MONANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
SCITAMINEÆ.

GENERIC CHARACTER.—Both the limbs of the *corolla* are divided into three parts. *Calyx* hardly discernible. *Stigma* consisting of two little plates.

SPECIFIC CHARACTER.—Leaves oblong, of a purple colour beneath, above bright green marked with white. Flowers very delicate; the three dorsal segments lanceolate, and sharp pointed.

THIS has been an inhabitant of our stoves for many years. It flowers early in spring, generally in March or April, before the leaves make their appearance. The flowers emit a delightful fragrance, which may be perceived for some distance: they grow immediately from the root, opening in succession, but very seldom more than one is open at a time. The roots are supposed to be the Zedoary of the shops.

It is a native of the East Indies, and of course requires the heat of the stove, where it grows very freely in a mixture of light rich loam and peat. When dormant, like all other plants of the kind, very little water must be administered. It is increased by division of the roots.

The generic name was given in honour of E. Kæmpfer, a distinguished naturalist, author of Amœnitates Exoticæ. 1712.

Our drawing was taken at Chatsworth, from a flowering plant in the stove last March.

AZALEA PULCHRA.

(PRETTY AZALEA.)

CLASS. PENT-DECANDRIA.

ORDER. MONOGYNIA.

NATURAL ORDER. RHODORACEÆ.

GENERIC CHARACTER.—*Calyx* in five divisions; *corolla* cut into five segments, campanulate, or somewhat funnel-shaped. *Stigma* obtuse. *Capsule* five celled.

SPECIFIC CHARACTER.—A stout shrub, with spreading *branches* thickly covered with brown hairs, lying close to the stem, and pointing upwards. *Leaves* thickly covered with hairs on the lower side, and less so on the upper. *Leaf-stalks* somewhat short. *Flowers* usually solitary, occasionally from two to three, terminal. *Flower-stalks* short, clothed with white hairs. *Calyx* deeply parted, very hairy. *Corolla* bright rose colour, spotted with bright red spots on the two upper segments. *Stamens* ten. *Stigma* a glossy red.

SYNONYMS.—Rhododendron pulchrum, *Sweet's Brit. Fl. Gard.* Rhododendron indicum γ Smithii, *Sweet's Hort. Brit.*

THIS beautiful hybrid was raised a few years ago from seed produced by *A. ledifolia*, impregnated with the pollen of *Azalea indica*, by Mr. Smith, of Coombe Wood, Kingston. It flowers well with us in a cold greenhouse, potted in a mixture of sandy peat and light loam. The drawing was made in April last.

All tender Azaleas require one general mode of treatment, as follows:

1. Pot as soon as they have done flowering, which will be about the end of May, except those intended to be left for seed, which must remain until they have ripened their seed.

2. Use a mixture of equal parts of sandy loam and peat, with a small portion of leaf mould, in preference to all peat; and be careful in potting to give a good drainage of broken potsherds; for although they delight in moisture, stagnant water usually proves injurious to them.

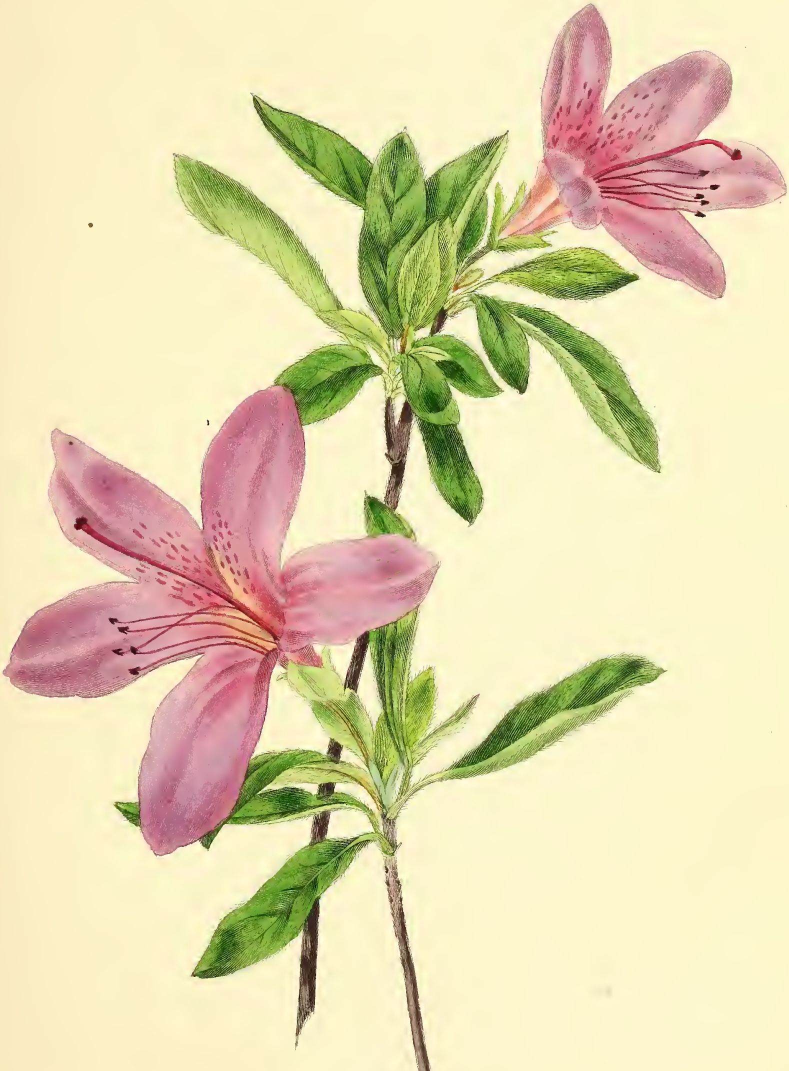
3. About the middle of June place them in a somewhat sheltered and shady situation out of doors.

4. Allow them to stand in this situation till September, then remove them into a pit or green-house, in an airy situation, until they are wanted for flowering.

5. It is a great assistance to them when about expanding their flowers, to remove them into an increased temperature; this should be from sixty to sixty-five degrees Fahrenheit, and the plants may be introduced in succession. Those introduced about the middle or end of September will come into flower towards the end of October, and will continue blooming till December; others brought in the middle of October will continue flowering till January; those brought in the end of November will continue flowering till February; when those in the pit or green-house will commence flowering, and continue till May.

6. When they are in flower a good supply of water is requisite to enable the plants to support them; any deficiency in this will cause the flowers speedily to fall.

7. When they have done flowering, assist them by every means to make young wood, a good supply of which must be secured before they are removed from the increased heat. For this purpose, syringe them about once or twice a week, and after they have grown considerably, remove them to the green-house, previous to



Azalia Pulchra?

their being turned out of doors, and treat them like other green-house plants, merely giving them a good supply of air and water.

8. When the young shoots are from four to six inches long they are best calculated for cuttings. Take them off after the plants are removed to the green-house; separate each cutting close to the old wood from whence they start, trim off no leaves but those which grow on that part intended to be inserted in the pot. They must be planted in either sand or light soil, the former is the best; plunge the pots in a little heat, and place a hand-glass over them, and in the course of a fortnight or three weeks they will strike root.

9. When they have struck root, transplant with balls into single pots, filled with the same compost recommended for the old plants, and again plunge them in a little heat until they have begun to grow, after which they may be removed to the green-house, and be treated like other green-house plants.

10. Many of the green-house species and varieties will bear a good degree of cold, and will thrive very well if planted under the wall of a stove, green-house, or other warm situation; but in winter they must be sheltered by mats from the effects of frost. The *Indica, Phœnicea,* flowers most beautifully when planted out in the border of a conservatory; it will there grow from four to six feet high, with a good supply of water, and slight shade.

11. Hardy species and varieties require little care; they may either be grown on beds or otherwise, to suit the fancy of the cultivator. Always select for them a situation somewhat shady and rather damp, but by no means one where water stagnates, unless a good drainage be laid underneath.

12. In all dry summers a good supply of water is advantageous, though not indispensible, but plants so treated always thrive more than under other circumstances.

13. Some of the species produce abundance of seed, which may be sown in pans or pots as soon as gathered; place them in a shady situation, and keep them rather moist, until they vegetate.

14. As soon as they are of a sufficient size, transplant them into other pots, and place them under glass, and slightly shaded until they have again started. Then expose them by degrees, until they are hardy enough to be planted out.

15. The hardy species and varieties are also readily propagated by layers and cuttings. The branches in layering merely require pegging down without any tongue, and a regular supply of moisture administered. The cuttings may be taken off precisely in the same manner as recommended for the green-house species and varieties; but, instead of planting in pots, they may be planted under a hand-glass on a shady border.

The Azalea is scarcely separable from Rhododendron with regard to the number of stamens; some seedlings raised from Azaleas with only five stamens, have themselves possessed ten, and even more, whilst seedlings raised from Rhododendrons have had less than ten stamens, and in other respects have very nearly resembled Azaleas.

The generic name is given from the natural habitation of the plants, many of the North American species growing in dry steep declivities, or on dry plains, where for a long time they can scarcely receive any moisture.

MARICA CÆRULEA.

(BLUE MARICA.)

CLASS.
TRIANDRIA.

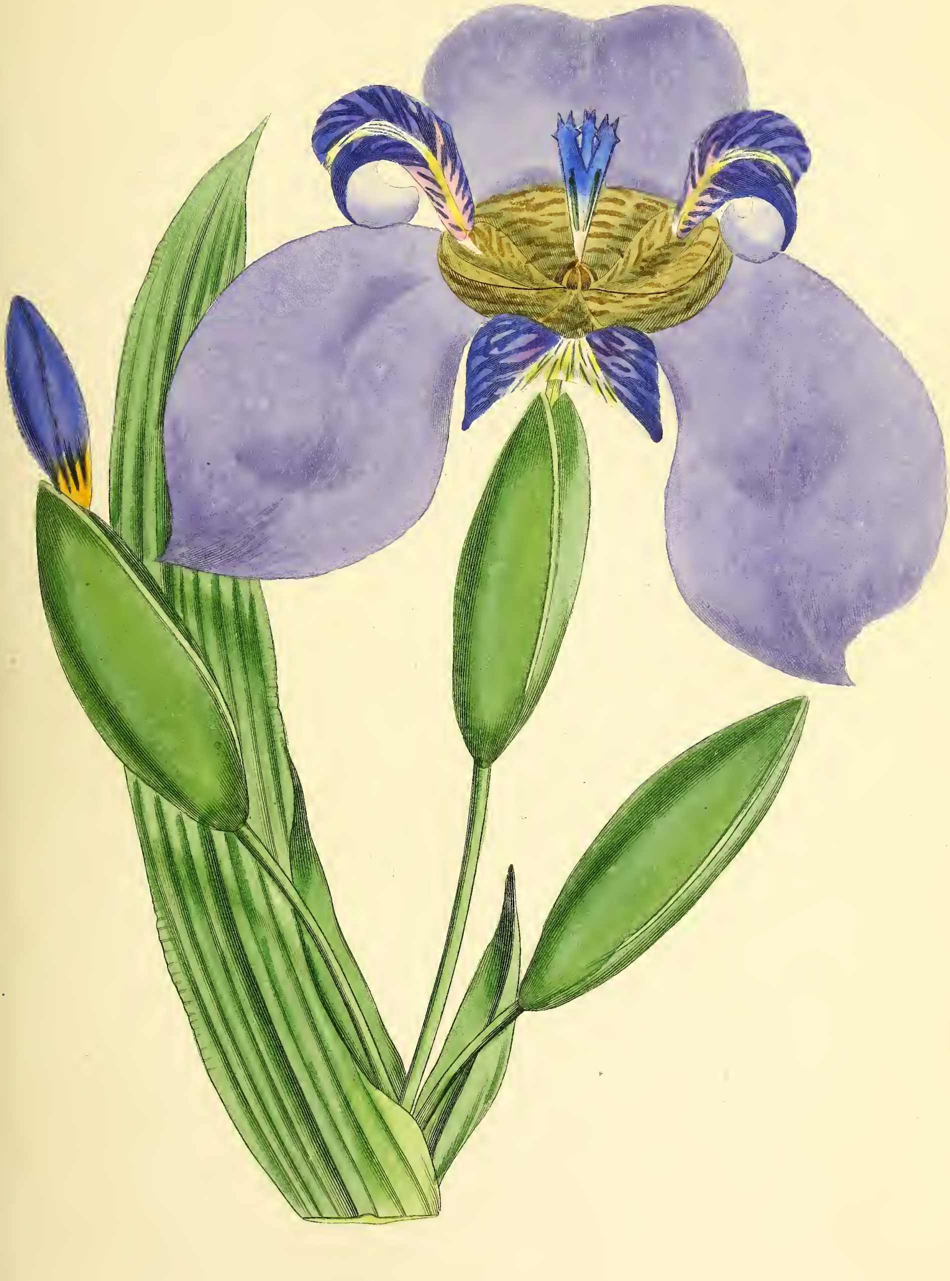
ORDER.
MONOGYNIA.

NATURAL ORDER.
IRIDEÆ.

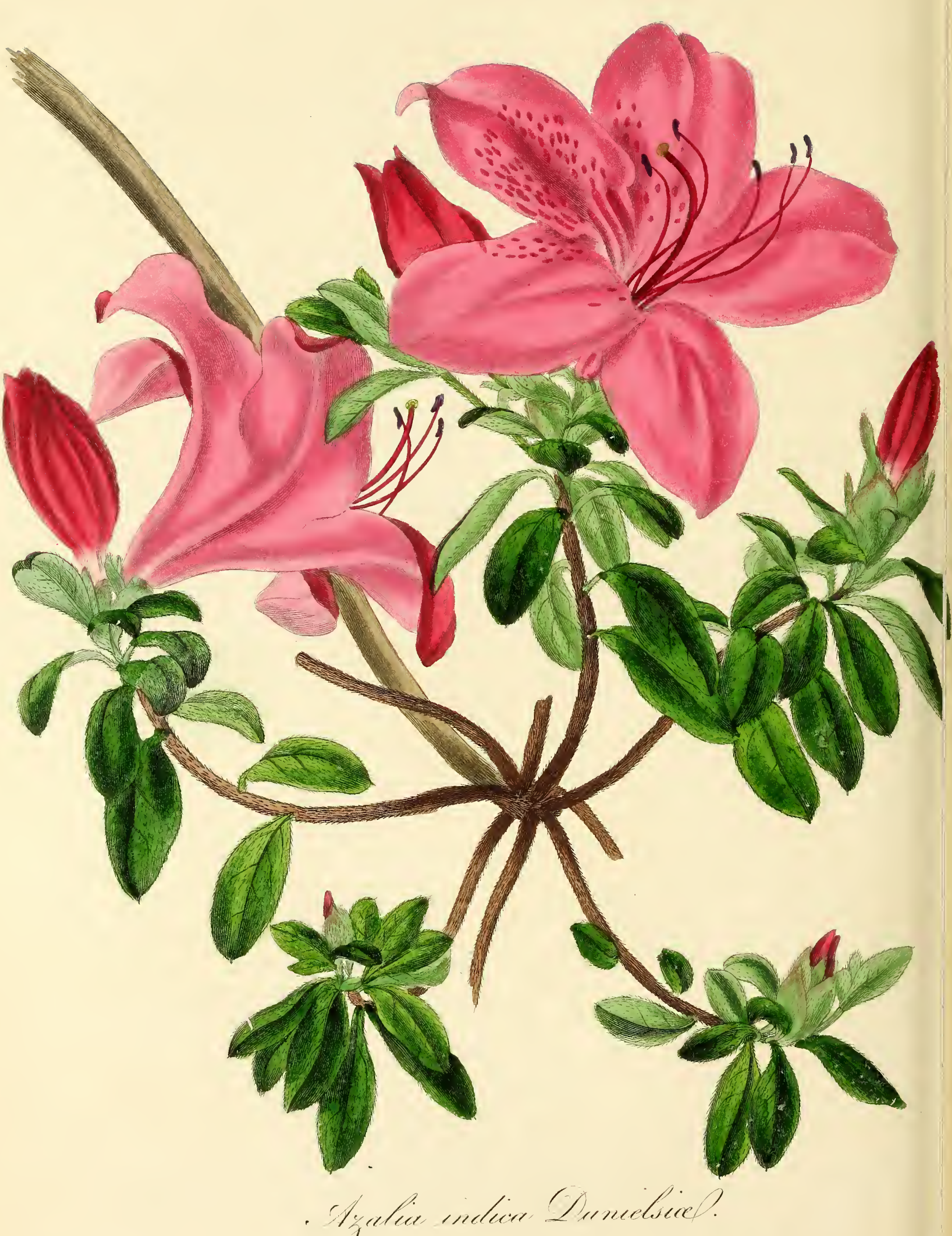
GENERIC CHARACTER.—See page 81.

SPECIFIC CHARACTER.—*Stem* upright and straight. *Spatha* not viviparous, three outer petals of the flower fine blue, not so deeply tinged with purple as the M. Sabini, inner ones much curled, marked with rich dark blue, centre of the flower streaked with brown on a yellowish ground. *Scape* many flowered, often two or three flowers in blow at a time.

THIS beautiful plant is a native of the Brazils, from whence it was introduced in 1818. It flowers with the greatest freedom in our stoves, with but little care and trouble. The plant from which our drawing was taken continued flowering six weeks or more, in the stove at Chatsworth. The flowers emit a similar fragrance to those of the M. Sabini, but they are of a larger size. The mode of culture is in every respect the same as that recommended for the M. Sabini, page 81.



Marica cærulea.



Azalia indica Danielsiæ.

AZALEA DANIELSIANA.

(MRS. CAPTAIN DANIELS' CHINESE AZALEA.)

CLASS.		ORDER.
PENTANDRIA.		MONOGYNIA.

NATURAL ORDER.
RHODORACEÆ.

GENERIC CHARACTER.—*Calyx* five-toothed. *Corolla* funnel-shaped, limb in four or five divisions. *Stamens* inserted in the receptacle unequal. *Capsule* three or five celled; seeds naked.

SPECIFIC CHARACTER.—*Leaves* spatulate, smooth, shining when young, slightly downy beneath. *Flowers* as represented in the plate. *Anthers* dark purple or black, pollen white. *Stems* pliant, and bending downward, producing numerous branches at the termination of each year's growth, disposed in rayed order.

THIS plant, like most of its congeners, thrives well in rough sandy peat earth; the pots being well drained; kept in a dry airy part of the green-house in winter, and then not over watered. If placed in moist heat previous to flowering, causes a more perfect bloom. It is probable that it may be propagated, like the other Chinese species, viz. by cuttings and layers.

It is generally admitted that the empire of China has furnished to Europe more splendid flowering plants than any other portion of the globe; whether we view the various species collected in an indigenous state in that extensive empire, or the more generally cultivated and selected objects from the celebrated gardens of Fa-te, near Canton, where every plant worthy of cultivation is to be obtained.

Captain Daniels, of the Honourable East India Company's service, brought home several cases of rare plants for Mr. Tate, of Sloane-street, in 1830, among which were the *double red* and *variegated* Chinese Azaleas. We believe the present plant to be a genuine species, as we can trace no connection between it and any other known species or variety already introduced.

At the suggestion of Mr. Tate, we have named this truly splendid Azalea, in compliment to Mrs. Captain Daniels, as an honour due to that lady for the introduction of so fine a plant, and for the kind and liberal spirit with which the whole of the boxes were communicated.

We have pleasure in stating, that from Mr. Tate's successful management, if not now, he will soon be able to supply every botanical collection with flowering specimens of this new addition to our stock of Chinese ornamental shrubs, and which indeed no lover of fine plants should be without.

The figure being engraved and printed off before we had an opportunity of examining the plant, and making out the description, is the reason why on the plate it is stated to be a variety of the *A. indica,* and in the description a distinct species.

COST OF FITTING UP AND GENERAL MANAGEMENT OF GREEN-HOUSES.

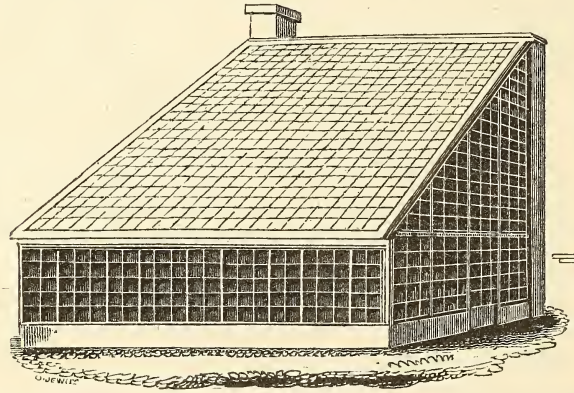
All green-house plants being natives of temperate climates, as the Cape of Good Hope, New Holland, &c., require very little artificial heat, and *that* only under certain circumstances.

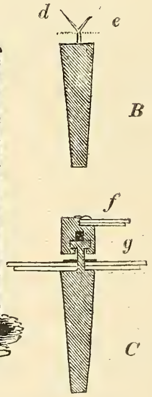
In building a green-house always place it so as to receive the full benefit of the morning and mid-day sun. This is particularly necessary for the welfare of the plants during winter and early in the spring.

Light is indispensible, therefore, so construct the building, that as little light is obstructed as possible. Also the back and front sashes, or ventilators, which in our opinion, are far better, should be fixed to open with ease, for the admission of as large a quantity of air as will be required at different times in the year.

With regard to the materials of which the roof ought to be constructed, we would always give preference to wood, except in certain forms of structure, when metal may be used with advantage, of which we shall speak more at length at a future time.

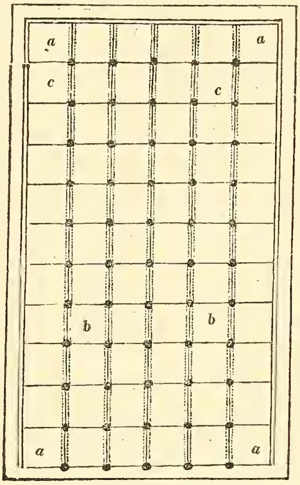
The mode of glazing may in some measure depend on the taste of the proprietor, or those into whose hands he commits the care of the building. In no case, however, should the laps of the glass be puttied, because the circulation of the air is thereby greatly impeded. If beauty is an object, the glass on the roof should be cut in squares of about six inches by seven inches, but for cheapness and strength six by three inches is preferable; and if the laps be small, and the workmanship be done judiciously, the glazing will look very well.



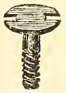


Mr. Saul's system of glazing is intended to protect the rafters and bars entirely from exposure to the weather, and to give the outside of the roof a smooth and even appearance. *B*, is a section of the rafters; *d*, *e*, is a thin piece of metal, which runs betwixt every joint on the sash-bars, with the upper part divided, so as to turn over each joint about a quarter of an inch. The glass is bedded in putty on the top of the sash-bars, and a little white lead is put under *d*, *e*, and when turned down, it is rendered completely waterproof. *C*, is intended to show the plan of the slides on the roof for giving air. *f*, is the top of the slide; *g*, the top of the roof. By this plan, the slide can never be blown off, and the appearance of the whole is light, because there is no projection of wood above the glass.

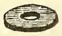
The system of Messrs. Harrison and Curtis, which we noticed in the Horticultural Register, Vol. I., p. 10, is intended to answer the same purpose as Mr. Saul's. In making lights on this principle, the outer frame of the sash is made in the usual way, and rabbeted at the inside of the head and side-stiles of the frame or sash, to receive the outside edge of the glass; the inside of the frame is furnished with bars, the upper surfaces of which are flat, and made even with the rabbet, *a*, *a*, at the sides and head of the frame. The glass is cut in squares so that when placed on the bars it meets quite close at the edges up the middle of the bars, *b*, *b*, and close to the sides of the rabbet, *a*. In this process of glazing, a very thin coat of putty is laid on the surface of the bars, upon which the glass is placed, and then pressed down, so as to leave the least quantity possible remaining at the under side of the glass. The squares are secured by means of a metallic screw, A, and lead collar, B, screwed on at each angle *c*, *c*, the lower edge of the collar being bent down to hold the glass in its place. On this method there is no midrib above the glass: there is much less shade than in the old plan. The evils naturally attendant on the cracking of the putty, its separating from the wood, and admitting water to enter and drop into the house, are all entirely prevented; it also dispenses with the renewal of putty, or having to paint the outside of the frame, which is an annual saving in expense, and keeps all the materials under the glass quite dry.



A



B



But there are important objections to this system:—

1st. The screws at the angles of the squares of glass become in a little time so fast by being rusted in, that they cannot be got out but by violent means, at least this is the case with those lights in our possession glazed on this principle. So that when there is occasion to repair, much trouble and inconvenience is experienced.

2ndly. There requires much minuteness in cutting the squares of glass, so as to make them exactly meet upon the midrib, for if any crack remains, the water will find its way betwixt the putty and glass.

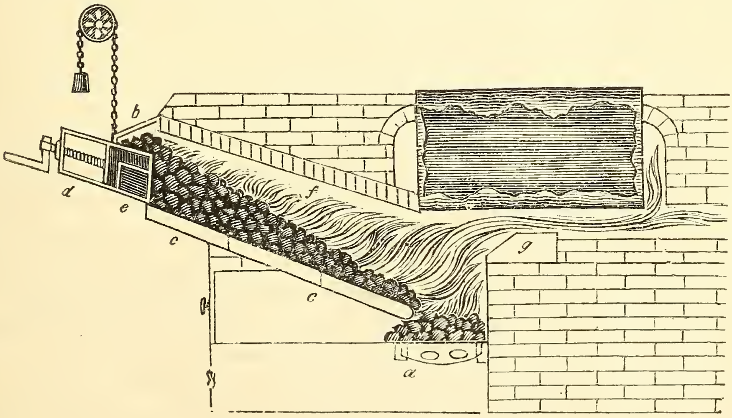
It is necessary that every facility should be afforded for increasing the temperature of the house in severe weather. For although artificial heat should never be had recourse to for green-house plants if it can be avoided, because they thrive far better without it, yet in times of sharp frost, excessive dampness, or the like, fire is indispensible to secure them from injury. Heat may be conveyed by means of either flues, hot-water pipes, or steam.

By whatever means the heat is conveyed, the construction must be such as that the heat given out will speedily raise the temperature of the house; because, in case of a sudden frost, were the increase of heat slow, the plants might be destroyed before the remedy could be applied.

As no green-houses require artificial heat more than six weeks or two months at most in a year, and in some cases not half that time, we would recommend common flues to be used in preference to hot-water pipes; yet in plant stoves, where considerable heat is regularly required, hot-water pipes may be used advantageously, if properly constructed. Chanter's improved patent smoke-burner is the best kind of fire-place in use, where a quick and good command of heat is required, being a combination of great chemical and mechanical knowledge; it was invented by Mr. Witty, civil engineer. In the first place, there is a carbonising plate or shelf constructed, on which the coal is submitted to two processes; viz., carbonisation and combustion. Over the carbonising plate is formed an arch of fire-tile, or Stourbridge brick; the arch radiates sufficient heat to produce a powerful effect upon the coal, which instantly gives out plentiful streams of carburetted hydrogen gas. The gas being thus formed at a high temperature, is immediately inflamed by a due proportion of atmospheric air rushing through the heated coke at the bottom of the furnace, which, meeting the gas, produces a brilliant and lasting fire, and from its purity of flame prevents soot from lodging in the flues, if common attention be given at the first lighting, and it can be kept in for months together, without re-lighting, if required.

Mr. Chanter, a short time ago, furnished us with a list of testimonials, in a book, with a drawing of the construction of the furnace, and he referred us particularly to the report of Messrs. Wilmot of Isleworth, Macintosh of Claremont, and other practical and celebrated horticulturalists, which he felt aware would convince us of the great importance and utility of the furnace for all purposes; we were, however, convinced previous to this, having had some erected at Chatsworth. The great injury and annoyance arising to conservatories, gardens, and neighbouring dwellings, under all preceding constructions of furnaces or stoves, are, by this improved invention, wholly and most perfectly removed. In the interior, under the highest temperature ever required, the heat is genial and bland; no particle of smoke or suffocating vapour is perceptible to the senses, or by those tests which can, under such circumstances, be applied. The flue has been opened, and at 80° appears to contain or convey nothing but a perfectly sweet moist heat; nothing escapes from the chimney but a slight steam, and probably carbonic acid gas, as pale and as harmless as the steam from the waste-pipe of a steam engine. A similar relief from nuisances, and from much greater injury, is obtained by the adoption of this furnace in delicate manufactures, in dyeing, bleaching, washing, brewing, &c.; and in chemical manufactures. With regard to profit arising from a diminished consumption of fuel, the advantage, varying from one quarter to one third, is common to all cases whatever, from the domestic stove to the vast engines which, in their operation, render the mines of our country almost as valuable as its surface.

In order to justify the foregoing statement, it will be necessary to refer to former usages, and point out whence the present advantages arise. The common furnace has usually consisted of a large grate, which formed the floor and support of the fire, and it was generally surmounted by an arch or boiler, or any body to be heated. It frequently, but not always, had two doors, one to admit the fuel, the other to facilitate the stoking, and to draw out the ashes; but this excessive extent of grate admits too much air, by which the fire is kept below the temperature required to consume the smoke; and, omitting all consideration of the clouds of smoke vomited during the first kindling and raising the fire, a similar emission of clouds occurs whenever a fresh supply of fuel is required, until the parts of the coal, which sublime in dense smoke and soot are dispersed in nuisance and waste. The great cause of this is, that the moment the door of the furnace is thrown open, a vast quantity of cold air sweeps under the boiler or through the flues, and carries away the heat; then the cold, raw, or perhaps wet coal, is thrown into the centre of the fire, which reduces the temperature; destroying in one moment, all the effect required, liberating the product of the coal in an imperfect state at a low temperature, and thus producing volumes of thick smoke, which, when once formed, it becomes impossible to burn, except at a temperature that will melt iron, which is stated to be 3000 degrees, and this, of course, would require an amazing quantity of fuel. In Witty's Patent Gas Furnace, a certain proportion, say about a third only, of the floor consists of a grate, *a*, between which and the feeder, *b*, an inclined plane is placed, *c*, at an angle of thirty or forty degrees; instead of the common door or doors, a sufficient orifice is well fitted by an iron box, *d*, the part of which, nearest the fire, is left open in the form of a hopper or feeder, to receive the charge of fuel. A slate is closed upon the fuel, and it is pushed forward on the inclined plane by a smaller box, or square piston (*e*), fitted within the hinder part of the large box, moved by a screw, by which it is brought back to its first position, when a fresh supply is required. An arch of brick-work (*f*), covered by the best non-conductors of heat, such as powdered charcoal, or saw-dust, &c., surmounts the plane, and leads to the flue, to the bottom of the boiler, or to the body to be heated. A breast-work of brick behind (*g*), projecting



a little over the grate, gives a proper direction to the current of air rising through the fire. This arrangement being completed, a fire is made on the grate, the flame is covered with fuel, and the mouth well closed; the plane and the arch are thus converted into a retort. The heat of the fire and of the hot air rising through it, which is strongly reverberated from the arch, promotes the distillation of the nearer portions of the fuel; the vapours or gases as they rise are whirled into the current towards the flue, and meeting with the rush of heated air through the fire are inflamed and completely consumed. This process continues till the coal is perfectly caked. When a supply is required, fresh coal is placed in the feeder, and thrust on by the screw and box, which thus pushes forward the coke on the plane, till it falls on the grate, and then serves to distil and cake the new quantity.

The command of heat is much greater, with less trouble, and the annoyance from smoke, for the most part, is removed. Mr. Wilmot, of Isleworth, in writing on the advantages derived from some which he has had erected, says, "After three months' trial, I can now give you an account of the difference between your gas furnace and those on the old principle; the former has that decided preference that it only requires to be made known to be universally adopted. I put the lights on two vineries, sixty feet long (each), heated by hot water, on the 10th of January, the houses joining each other, with a glass partition between the boilers and pipes, both of the same construction; as such we started fair. The result is, that from that time until this date, April 13, 1833, the gas furnace is one month earlier than the old ones, and both houses have as good a crop of grapes as I ever saw grow. In February I put the lights on two more vineries, of the same construction, but heated with flues instead of hot water, one is worked with the old furnace and the other with yours. Yours has again the preference of nearly one month; and I have no doubt I shall cut grapes in it a month earlier than in the old one, and both houses have as good as I ever wish to have. The one I have attached to a pine house is certainly in the same proportions, but the smaller one you last sent me to try the experiment exceeds all. It is under a small boiler which works from three-inch pipes, in a house put up on purpose; and, although but eight inches, I consider it capable of heating any house, provided it be worked with hot water pipes. The use of the gas furnace is the greatest saving that can possibly be invented, not only in the consumption of fuel, but of the labour; while the uncertainty attending the old furnaces is entirely alleviated, and one person can attend to twenty of yours with more ease to himself than to four of the old ones. The certainty of being able to leave it twelve hours in early firing, without finding any material difference in the thermometer, speaks more for this valuable discovery than if I were to write a volume on the subject." Mr. M'Intosh, gardener at Claremont, writes as follows: "The economy in fuel is more than one-third, nearly one-half. The trouble of attending them is next to nothing, as they are done up for the night at six o'clock in the evening; and even in cold weather do not require any other attention till seven or eight o'clock next morning, and in mild weather not till five or six o'clock on the evening following. In consequence of the extraordinary degree of heat produced in the furnace (nearly 3,000 degrees of Fahr.), not only is the smoke consumed, after the fire has been burning for a short time, but all those noxious gases which attend flues heated in the ordinary manner are entirely destroyed. The gaseous steam produced by your furnace it by no means injurious to the most delicate plant, probably the reverse. Several plants submitted to its effects were not in the least injured, neither does it appear, by a careful chemical analysis, that it contains anything injurious to vegetation."

From these testimonials and our own experience, we certainly would recommend the use of it for a hot-water apparatus, in preference to one built on the old principle. For, although the cost is greater at the outset, yet the constant command of heat, and the refuse capable of being burnt in it as fuel, speak highly in its favour. When it is determined to heat by hot water pipes, the following cheap mode may be useful as a guide, the expense we detailed in the "Horticultural Register," vol. i., p. 300. The materials may be obtained at any ironmonger's. Our correspondent, who furnished us with it, obtained his materials from Messrs. Graham and Sons, Iron Wharf, Trig Lane, Thames Street, London.

Cost of fitting a forcing flower-house, the back flue being retained, and the hot-water pipes traversing only the east end and the front; the delivery pipe and the return pipe being of the same diameter.

	£	*s.*	*d.*
Round Boiler	2	8	9
18 yards, 4 inches, round pipe, at 4*s.* 3*d.*	3	16	6
Elbow instead of cistern	0	8	6
Country smith fixing joints, &c.	2	0	0
Country bricklayer setting boiler, &c., about	3	0	0
	11	13	9

Cost of a conservatory, about 55 feet long, the delivery and return pipes of the same diameter, and placed one below the other, the length of the house.

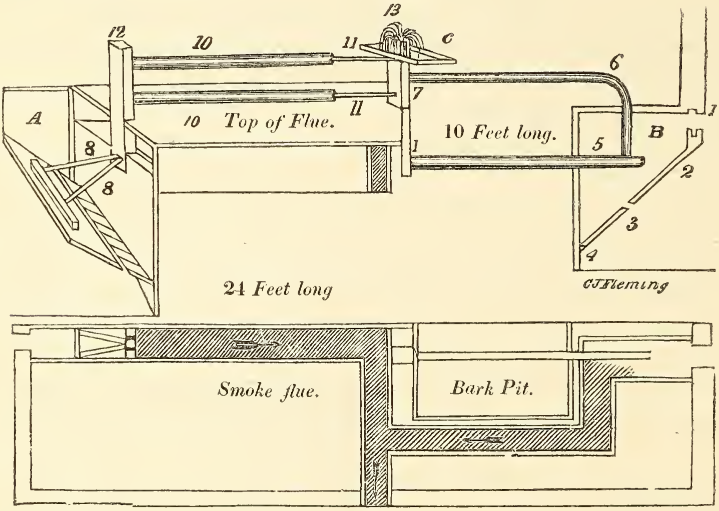
	£	*s.*	*d.*
Square boiler	5	13	11
Square cistern	1	13	9
34 yards, 4 inches, pipe, at 4*s.* 3*d.*	7	4	6
Country smith, as above	4	2	0
Country bricklayer about	4	0	0
	22	14	2

If more heat is required, a double length of delivery pipe would cause additional expense of—

	£	*s.*	*d.*
17 yards, 4 inches, pipe, at 4*s.* 3*d.*	3	12	3
Smith, joints, and fixing	2	0	0
	5	12	3

There exists much difference of opinion respecting the size and form proper for boilers, of which we shall have occasion to speak more hereafter. Mr. Saul, of

Lancaster, tried the experiment of doing entirely without one, by introducing the pipes themselves into the fire. The result of his experiments he furnished us with, together with a plan, which we here insert. His first experiment was placing the lower pipe into the fire, so that the water would pass through the flames, next he placed two pipes in the fire so as not to pass over, but be forced back again; this he found to have a decided advantage over the pipe which conveyed the water straight through the fire, as the water was forced in those two pipes backward and forward, giving a strong motion, something like that of a pump, the hot water being forced forward, and the cold forced to the pipes in the fire. All sediment too, which might accumulate in the pipes, is entirely prevented by this strong motion. There is a regular stroke of six inches with a regular fire, but if the heat is increased the stroke will increase two or three inches.



The house in which the experiment was tried is 24 feet long, 14 feet wide, and 12 feet high at the back. There are two fire places, one at each end, as in the figure, *A*, *B*. The fire place at *A* is in prospective to show it more clearly. That at *B* is only a section; both fire places are of the same size. 1, is a sliding door at which the fire is supplied with coals; 2, an inclined plane, two feet six inches long, and fifteen inches broad, made of cast iron; 3, is the grate, fifteen inches by twelve; the ashes fall through at 4, as fast as they are made, all the coals sliding down the grate as they burn: the greater part of the smoke also is converted into heat, being compelled to pass over the flames of the fire on the grate, in its road to the flue; 5, is a single pipe, three inches diameter inside, which passes under the bark pit; 6, a small return pipe, about an inch in diameter, inside measure; 7, the connector which acts for all the pipes, as never more than one fire is in use at one time. The two pipes, 8, are twenty-one inches long, and one and a half inches diameter inside; the two pipes, 10, are eight feet long, and three inches diameter inside the pipes, 11, are two feet long, and one inch diameter inside; the two connectors are two and a half inches by four, and a half inch square; *C* is a reservoir for supplying the pipes with water as it wastes, through a small hole about the size of a quill, having a plug which prevents an increase of steam, but does not prevent the water from dropping into the reservoir. Also, if the strokes are increased above six inches, and the water thrown over at 13, it is caught in this reservoir and thus enters again into the pipes. The top, 12, is closed, six inches being allowed from the pipe, 10, to the top.

Thus much for the present on heating-houses; we shall resume the subject again shortly, and give our opinion more at large, and shall at this content ourselves with giving a few hints on the general management of green-houses. Green-house plants should never be supplied with mud water in wet or frosty weather, and none unless the soil in the pots becomes dry. This rule must be particularly attended to, from the beginning of November till the end of February.

In March, the plants may be occasionally syringed over head to clear and refresh the leaves, but always select fine days for the purpose, and let this, as well as the general waterings, be done in the morning, from the middle of September till the beginning of May, and at all other times in the evenings.

As the season advances and the weather becomes milder, increase the quantity of air, until, by the middle of May, a large portion of air may be left on all night, except in case of severe frost. And this rule of admitting air must be attended to throughout the winter at every convenient opportunity; but always making a practice of shutting up early in the afternoon.

Always keep the plants clean and perfectly free from dead leaves and weeds; this must be particularly attended to in the winter season.

About the beginning of March re-pot all the plants that require it, and top-dress the remainder with good fresh soil. Some free-growing kinds may require potting two or three times in the course of the summer, but the last potting should never be later than the middle of September.

As green-house plants materially differ from each other in habits, so also the soil suitable for them must vary in proportion. For a general idea on the subject we beg to refer our readers to page 40, where, in our hints on "The Management of Plants in Rooms," we have given a few general rules as a guide to the inexperienced.

Never pot the plants in a soil too wet; better to keep the soil rather dry than otherwise. Nor ever sift the soil, but chop and break it as fine as can be got, because sifting deprives it of the fibrous particles, amongst which the roots grow very rapidly. Always in potting give a good drainage with broken potsherds.

In the beginning of June the plants may be removed to their summer station, out of doors. Always place them on an aspect screened from the effects of the mid-day sun, but yet where they will be able to receive the sun morning and evening; whilst in this situation they must be supplied with water as often as is requisite.

In the beginning of September again examine them throughout, and pot all that require it, and top-dress the remainder; by no means let this be done later than the middle of September, or the plants will not have time to recover before winter.

Not later than the first week in October prepare to remove them back into the green-house. Clean and properly tie them up previous to setting them on the stage.

After they are removed again to the house, give them abundance of air day and night, and continue gradually to decrease it as the weather becomes colder.

The propagation of green-house plants must be performed at different times of the year, according to the nature and habits of the plants, and the state of growth in which the cuttings will strike with the greatest freedom. Some grow the best when the wood is quite young and tender, others when it begins to assume a brownish colour, called half-ripened, and others when it has become quite hard and ripe. But as a general rule, half-ripened cuttings will do best.

All hard-wooded plants make roots best in clear sand, but soft-wooded kinds should be planted in a light mixture of loam. Therefore, after well draining the pots or pans intended to receive the cuttings, fill them according to the nature of the plants to be propagated. On no account plant soft-wooded and hard-wooded cuttings in the same pot.

Some sorts will not grow readily without a little bottom heat. Plunge the pots in a cucumber frame, or pit of any kind, where they will receive the benefit of warmth.

After putting them in, give them a gentle sprinkling of water with a rose; keep the frame as closely shut down as can be until the cuttings are struck, which wil be in about three weeks or a month, with some few exceptions. Look them over and water as often as they require it. Those sorts requiring to be covered with bell or hand glasses will require to have the glasses taken off occasionally and wiped, to prevent the cuttings from being injured by damp.

When the cuttings have struck root and begin to grow, then pot them in small pots filled with soil suitable to their nature; replace them for awhile in the frame and gradually expose them to the air until they will bear the temperature and treatment of the other plants in the green-house.

Sow the seeds of green-house plants in pans or pots, filled with a light soil, as early in the spring as possible; place the pots in a very gentle heat, keep the soil damp by covering with moss, and occasionally sprinkling with water; and when they are about an inch high pot them off into small-sized pots, and treat them as cuttings.

ON THE CULTURE OF ROSES.

This ornament and charm both of the palace and the cottage, seems to have been an universal favourite for an unknown length of time, both throughout Europe and Asia. Along the plains of Syria, roses are formed in thick plantations, and form one of the means of subsistence to the natives, who convert the leaves and flowers into cakes, otto, and tarts; the latter, according to modern British travellers, are very delicious: it is not certain, however, what are the species there cultivated. At Damascus the young tops of rose trees are gathered and eaten as vegetables.

But few sorts appear to have been cultivated till within the last forty years, during which time a great number of beautiful varieties have been raised from seed on the Continent, chiefly in France. Upwards of three hundred new varieties have also been raised in Britain, chiefly produced from the *R. spinosissima* or Scotch rose, thus swelling up the nursery catalogues to upwards of a thousand names; many of these, however, so nearly resemble each other, that they can scarcely be considered distinct varieties, but the trifling variations which do exist may probably arise from the different situations, soils, &c. in which they grow. This is particularly the case with many of the French roses, and most judges have come to the conclusion that there do not exist many more than five hundred distinct varieties.

The observations on the culture of roses made by our kind friend J. T., in the Horticultural Register, vol. i. page 551, so nearly meet our views on the subject, that we are not aware that much amendment can be made in dividing the genus. Though plants are greatly altered by culture, yet they generally retain a considerable bias to the soil and situation for which, by nature, they are formed; and it is usually within a certain range only of their natural habits, that they are capable of improvement by cultivation. The genus, in point of differences in culture, may be separated into five divisions.

The first division contains the *R. spinosissima, lutea, sulphurea, cinnamomea,* and their numerous varieties, including all those with slender shoots, small and numerous thorns, and fibrous roots growing very near the surface of the ground, and which in their wild state grow on heaths and places where there is but little depth of soil, and are surrounded only by plants of a low stature; and are also generally exposed to the browsing of cattle. The culture of these may be stated as follows:

1. Always plant them in an airy open situation, where they are fully exposed to the sun, but not where the ground is very low and swampy.

2. The soil in which they will flourish best is a light sandy loam, or a mixture of loam and sandy peat.

3. Pruning and shortening them may be practised to almost any extent without materially injuring them.

4. As the roots run near to the surface of the ground, they will grow where the soil is very shallow. They will also endure much drought, and flourish in situations where few or none of the other species or varieties would live.

The second division includes the numerous varieties of *Rosa provincialis,* or *centifolia,* and *Gallica.* The varieties of these species are so numerous, that this division contains the greatest number as well as many of the most beautiful roses. They appear to be plants which in their natural situation have to contend with high grasses, and other strong growing perennial plants; when overpowered by these, they remove by sending out roots near the surface of the ground, which when they reach a more airy spot, throw up suckers, these exhaust the old plant, and form a new one in a better situation. The roots of this division are somewhat less fibrous than those of the first, but they also grow near the surface of the ground. They may be cultivated as follows:—

5. Always plant this division in a rich loamy soil in preference to light soil.

6. They do not require to be planted in situations so exposed as those of the first

division, but will thrive mingled with other plants on the borders, or other situations.

7. The plants of this division will not bear pruning to the extent of the first, but they are less impatient of the knife than any of the following divisions, requiring to be cut-in, as explained in the rules.

The third division consists of *R. villosa, rubiginosa, moschata, alba, Damascena,* and *canina:* the roses of this division have much stronger roots than the others, and strike much deeper into the earth. The place of their growth, in their wild state, is amongst large strong growing shrubs and trees; they therefore require a much stronger and deeper soil, and a less airy situation than the two former divisions. They do not need nor bear so much pruning of the shoots indeed some of these species are often rendered less productive of flowers for a year or two, by too much cutting; and the main stems of some, the *R. villosa* for example, will send out good blooming shoots for more than half a century, with only a moderate occasional pruning to keep the plant in proper form and bounds. Cultivate them as follows:—

8. These require to be planted in deep, rich, loamy soil, if somewhat strong it will be all the better; for although their roots strike deeper into the ground than those of any of the other divisions, yet they seldom flourish if planted in dry exposed situations, particularly if the soil be light and sandy.

9. If convenient, therefore, always plant them in situations where they will be partially shaded by other plants, or by each other.

The fourth division consists of *R. arvensis, sempervirens, Banksia, multiflora,* &c. These roses in their natural state trail along the ground, or support themselves by bushes growing near them; they therefore do not require a very airy situation: their roots are strong, but not so strong as some of those of the last division, and therefore seem to require rather a lighter soil: they require supporting or nailing against a wall.

10. Always select, if possible, for this division, a situation somewhat sheltered; they will thrive nailed to walls or fencing in any aspect, but prefer an east or west rather than south. Yet they will flower well on a south aspect after they have become a sufficient shelter to themselves, or are entwined amongst other plants.

11. The plants of this division require very little or no pruning, except to keep the plants within due bounds, for they invariably suffer from the use of the knife.

The fifth division consists of *R. semperflorens,* and *indica,* &c. with their varieties. The sudden and rapid way in which these roses send forth their shoots immediately on a change from cold to heat, points them out as growing in their wild state, on mountains covered with snow a part of the year, and like other natives of such places, with rapidity, taking advantage of an interval of warmth to grow, bloom, and ripen their seeds.

12. The plants in this division thrive well in a mixture of sandy loam and peat. They are usually grown in pots, or are trained against walls. There are many varieties, most of which are hardy enough to endure our winters out of doors. If sheltered in the green-house, where they well deserve a place, they flower most of the winter.

The usual modes of propagation are by layers, when the true sorts are intended to be preserved, by cuttings, for such as the *R. indica, semperflorens, Banksia, noisette,* &c., by suckers, as in the Provence and French roses, &c., by seeds when new varieties are wanted, and by budding and grafting when standards are wanted, or a variety of coloured flowers on one bush.

13. *Layering* is performed thus. In the beginning of July, just when the tree is coming into flower, having provided yourself with a sharp knife, and a few hooked pegs, commence by taking hold of the shoot intended to be layered, and make an incision just below a bud on the upper side of the branch, making your knife pass half way up to the next bud above; then give the branch a slight twist, that the part so cut may rest upon the soil; stick in your peg, to hold it in its place, and cover it up with soil, to about the depth of two inches. The custom of layering without the incision retards their striking so long, that very often they are not fit to separate from the stools until the following spring; whereas if the incision be made, they seldom require more than two months, or at most, three, if the weather be favourable.

14. *Cuttings.* There are very few, except the *indica, semperflorens,* &c., and their varieties, which appear to strike freely from cuttings. Any time in May is the best time for putting them in; after having prepared a quantity, plant them, under a hand-glass on a north aspect, in a composition of leaf mould and light loam, well broken or sifted.

15. Make each cutting not less than four joints long, and not more than six; trim off the leaves only from that part which is to be inserted in the earth, and leave all the other leaves entire.

16. Always form the cuttings of the young shoots produced the same season; but this should never be done until the wood possesses a sufficient firmness and consistency, that is, when it becomes little less than half ripened. With regard, therefore, to the exact time of taking them off, the propagator must, to a certain extent, be governed by the situation in which the plants grow, or the sorts intended to be propagated.

17. Cuttings planted during May or the beginning of June will be ready to pot off in September; those planted in July may be potted about the end of the following April, and those planted in August will be ready for potting the following May or June.

18. All rose cuttings put in after June, should be planted on a south or south-east aspect, because, having to stand in that situation throughout the winter, they will receive the benefit of the morning and mid-day sun during that period, which will greatly assist their growth: whilst on the other hand, if they are planted on a north border and the winter be very wet, they will be liable to perish in consequence of having no sun to dry up the superfluous moisture.

19. A moderate supply of water during the summer months in all aspects is indispensable; this should be given with a fine rose, early in the morning, and the glasses should be left off for half an hour afterwards; or the cuttings may be exposed to occasional warm gentle showers. In winter, however, this practice must be totally discontinued.

20. Keep them perfectly free from dead leaves and weeds, particularly during the winter season.

21. Those planted during July and August in an aspect exposed to the sun, must be carefully shaded from the violence of his rays throughout the summer season, but in winter be allowed as much light as possible.

22. Always cover them carefully from the effects of frost during winter; and occasionally in fine sunny weather take off the glasses for half an hour at mid-day, to dry up the damp.

23. *Suckers.* Greater part of the sorts in this second division, as well as many others, will admit of being propagated by suckers, or by division of the root; care must be taken to dig them up with as much root as possible.

24. *Propagation by Seeds.* This mode is only practised when new varieties are wanted. Gather the *heps* as soon as ripe, and rub the seeds well out, and wash them clean in water, and spread the seed on a floor to dry.

25. When dry, fill some pans, or boxes, to within an inch of the top, with light sandy soil, broken small, but not sifted. Sow the seeds moderately thick, and cover them with about half an inch of the same soil, finely sifted; sprinkle a little water over them, and cover the surface with moss, or something of the kind, to preserve the soil moist; and place the box under a warm wall, and, when cold wet weather commences, remove it to a pit, or green-house.

26. As soon as the plants are up, which will be about March or April following, remove the moss; and when the plants are large enough, thin them out, transplanting all that are taken up into other pans or boxes. In the following spring they may all be planted out in a bed of light soil, and be treated like old plants.

27. *Budding.* All roses take readily by *budding*, or *grafting* one upon the other; but it is obviously necessary that free-growing kinds should be worked upon stocks which are likely to keep pace with them; and luxuriant and slow growers should not be worked together on the same plant, because the former, by absorbing an undue share of sap, would literally starve the latter.

28. The best time for the operation of budding to be performed is the end of July, or beginning of August. It is of primary importance with many kinds that the stock, at the time of being worked, should be healthy, free-growing, free from knots and excrescences, and in full sap. For, if the bark does not rise with facility, owing to a deficiency of sap, there will be considerable trouble to insert the bud at all, and, should that difficulty be overcome, the pains would in many cases be lost, for the buds would perish for want of a due supply of nourishment. This, however, must not be taken as a general rule, as many sorts will take freely, if the operation be performed in the spring, providing a small portion of wood be attached to the bud; for this purpose scions are cut, and stuck into the ground, until the bark of the stock will begin to rise. Many sorts will grow very readily, if inserted in a niche exactly fitting the bud, and tightly bound up with some soft bass mat.

29. The common dog rose is the best foundation for standard roses. Stocks of this species, transplanted out of copses and hedges any time from the middle of October to the end of November, and even as late as January, answer well for budding the succeeding summer: but those planted before the end of November are to be preferred, as they always grow more vigorous than any planted later.

30. With respect to the age of the stocks, little importance is to be attached, providing they have a good stem, free from knots.

31. As soon as the stocks are got up, if the situation for planting is not ready, lay them in by the heels, as the roots suffer materially by being exposed to the air.

32. When the stocks are planted, prune their tops to a suitable height, according to their strength, which, as the sizes will be various, so the height will be from one foot to six feet. Pruning may also be extended to the roots; take off all superfluous and rotten lumps, and shorten those which are very long.

33. When the stocks begin to grow, rub off all the buds except two or three at the top of the stem, as nicely placed as can be got. Should any one of these outstrip the others in growth, pinch off the end, when it has become about a foot long, to stop its progress, and give the weaker ones an opportunity of growing also.

34. Always, if possible, select a damp and cloudy day for inserting the buds. If this cannot be obtained, early in the morning, and late in the evening, are the properest times.

35. In selecting buds, take them from healthy shoots, formed the previous year, in preference to the young spring shoots, the buds of which are not sufficiently advanced for the purpose. Choose only such as are plump, and perfectly formed, which are generally about the middle of the branch.

36. The operation of inserting the buds is the same as stated, page 36, rule 23; and should any fail, they may be replaced with others, making, of course, a fresh incision in the stock.

37. In February prune the branches of the stocks to within one or not more than two eyes above each of the buds inserted. These buds above the inserted bud are intended to draw up nourishment into the branches, which the inserted buds at present are partly unable to do. But, as soon as they have made sufficient shoots, the leading buds may be taken away, and the following winter the trees may be removed, and planted where most convenient.

38. The different kinds of China roses may be budded earlier than any other sorts, but on the same principle. The *R. semperflorens, Boursoult, noisette, &c.*, in many situations flower better, and grow stronger, than when supported by their own natural roots.

39. *Grafting.* This is more troublesome, and seldom so effectual as budding, yet where the buds failed the previous summer, it is worth the trial to supply their places by this means. In Flanders, cleft-grafting is much practised; the scion is either of the same diameter as the stock, or the cleft in the stock is made near enough to the side for the bark of the scion to come in contact with the bark of the stock on both sides: these are bound with ligatures of soft bass mat (first soaked in soap and water, and afterwards in a solution of alum, in order to render it impermeable to water); and then covered with a coat of clay, mixed with old slaked lime, made sufficiently thin to be applied with a brush.

Grafting by approach, or inarching, is practised with the best success when large heads are wanted very speedily. So soon as the plants indicate the circulation of the sap, take off the head of the stock at the proposed height, bending it, so that the plant designed to form the head is brought close to the top of the stock. Pare from the stem, two or three inches of the bark, with a portion of the wood, at the most convenient part for forming the junction; after which the stock is neatly made to correspond, and in such a manner that the part where the union is intended to take place is very little increased in size. Tonguing may be avoided, since it offers no advantage. They should be bound together with tape or good bass matting, and be covered with a little moss, which should be kept damp. Should the stock be very tall or weakly, the union of the parts would be strengthened and accelerated by making a small slit in the stock, and causing it to dip in the ground, or in a pot of earth placed for the purpose. Roots will be protruded at the slit, which will support the head considerably: and as the slit will heal, the roots may be pared off when the head and stock are united, and the place where they grew will scarcely be discernible*.

40. *Pruning*. The chief art of pruning consists in retaining certain branches to form a regular head; and in cutting those so as to effect that purpose, and, at the same time, cause them to throw out supplies of young wood. In the last week in February, or the first week in March, let every branch be shortened according to its strength, and cut out as much old wood as possible without disfiguring the tree. The young shoots of the preceding year, which are intended to produce flowers, should be pruned to about two or three eyes.

The following may probably be accounted the best hardy roses for training against a wall:—

BLUSH.

Rosa ruga
  Boursoulti
  Russeliana

RED.

Rosa hyacinthina
Longii
Grevillii

YELLOW.

Banksia multiplex

WHITE.

Roxburghi
Nivea
Multiflora platyphylla
Noisette varieties.

The *R. Boursoulti, Roxburghi, hyacinthina,* and *Grevillii,* require a good warm situation, or they will not flower to perfection.

41. *To retard the blooming season.* Leave the trees unpruned until the extreme buds of the previous year's shoots have pushed half an inch long; then cut them in below where any bud has pushed, and the dormant buds on the lower part of each shoot will be excited, and produce flowers in August and September. Shortening the shoots so late in the spring, does not in the least weaken the trees: they blossom as vigorously and freely as in the usual mode of treatment.

42. *Forcing.*—The sorts most to be recommended for forcing, are the Red Provence, Moss Provence, and White Provence, for the first flowering; and the Tuscany Damask, and Lady's Blush, for later flowering.

---

* Mr. Cameron in Hort. Register, vol ii. p. 400.

43. Take up strong suckers or layers at the end of October or beginning of November, and plant them in pots about five inches diameter, inside measure (upright forty-eights), filled with a good rich light loam, mixed with a small portion of vegetable mould, or well rotted dung.

44. In potting be careful to insert the lower part of the plant rather deeper than it grew; to accomplish this in pots of so small a size, it will be necessary in many cases to coil it round the pot two or three times. The next time of potting, place them in larger pots, and continue to do so every year until they are eventually placed in pots one foot diameter inside measure (twenty-fours), which is the largest size they ought ever to be allowed to stand in.

45. When potted for the first time, prune the tops so as not to leave above two or three buds above the soil; but at all the succeeding pottings prune them in the same way as those growing in the open borders.

46. When potted and pruned, plunge the pots up to the rim in an open airy situation, where they should be allowed to stand for one year.

47. When the plants have been potted about a year, introduce a quantity of them into the stove, and place them in a situation where they will receive about the heat of from seventy to eighty degrees by day, and sixty to seventy by night.

48. The times proper to take them in are as follow:—early in October for producing flowers about Christmas, in November for blooming in February, and so on every month, until the natural season for flowering in the open air.

49. As those plants first introduced into the house will be more easily excited the following year than those brought in later, it is advantageous to mark every lot as they are taken in, so that they may be started, in the same order as at first, every succeeding year.

50. During the time of forcing give a good supply of water at the roots, and water with a rose, or syringe them over the head, three times a week, when the weather is fine.

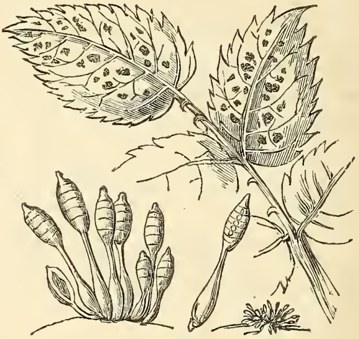
51. Be careful to smoke the house every month to destroy the *Aphidæ*, and pick off all grubs curled up in the leaves, or the crop of flowers most probably will fail.

52. After they have done flowering, allow them to remain either in a frame or green-house for two or three months, until their wood is a little mature, for if they are too suddenly exposed to the open air whilst the wood is tender (a method practised by many persons), they receive so severe a check, that they seldom or never mature their buds, so as to flower well the succeeding season.

53. Whilst they are making their wood, give them a good supply of water mixed with a little dung of either deer, sheep, fowls, or pigeons; this will replenish the soil, and greatly assist the plant. When they have partly done growing, turn them out of doors, placing them in a sheltered situation, and at the proper season, prune, pot, and introduce them into the house in rotation, as before.

54. *Insects and Diseases.* The rose is much infested with insects, particularly the rose plant louse (*Aphis rosæ*), which, however, may be easily destroyed by fumigation with tobacco, if the trees are in a house; and by making a solution of quick lime, soot, and water, of about the proportions of one peck of each to ten

gallons of water, if out of doors: after being well stirred together and left standing until the water has become quite clear, take it out with a watering pot, and mix with it about one-sixth of strong tobacco water; which if applied to the trees with a syringe, will effectually eradicate the *Aphides* and many of the larvæ of other insects which roll themselves up in the buds of the flowers and leaves. The rose gall-fly (*Cynips rosæ*) which receives its name from the rose-galls it occasions by puncturing the bark; the earwig (*Torficula auricularia*) is very destructive to the flower; the Cow-lady or Lady-bird (*Coccinella* 14 *guttata*); several species of the crane-fly, as *Cecydomia* and *Tipula,* and some of the saw-flies, as *Hylotomæ rosæ, Allanthus viridis,* and *Athalia rosæ,* with several species of moths, all of which deposit their eggs on the leaves and flowers where the larvæ feed, and if not picked off, eventually destroy the bloom if not the plants themselves. The Green Rose Chaffers (*Cetonia aurita*) are suspected by many persons to do much damage to the flowers, because they are often found about and upon them, sometimes in great numbers; but we believe it has been satisfactorily ascertained that they do not at all injure the essential parts of flowers, but merely suck the honey at the bottom of the corolla. The larvæ are blind, and roll themselves on their backs, contracting the annulations of their bodies, to move forward, instead of walking. They are two or three years in arriving at their perfect state*.



Rose Trees are also subject to a kind of fungus in certain situations called *Puccinia rosæ.* It first appears in very small red spots, which shortly increase till the leaves become partially covered with it in the form of a fine red dust. The seed-vessel has from four to seven cells (as is shown in the magnified plant), pointed, and the foot-stalk thickest at the base. The best remedy we have met with for this is to add a handful of sulphur to the mixture recommended for the *Aphis,* and sprinkle it with a watering pot rose.

Sap of the Rose Tree. From a plant of *R. rubiflora,* at Hammersmith, with a stem three feet and a half high and two inches and a quarter diameter, when deprived of its branches, and the head sawed off 29th of July, thirty-one ounces of sap flowed in about a week, which, together with loss by evaporation, exceeded three pints. Chemical analysis gave the following ingredients †:

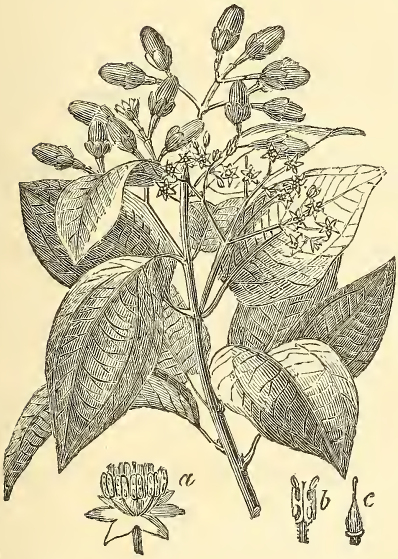
Oxalate of Lime	2.9	grains.
Acetate of Lime	1.907	do.
Acetate of Potash	0.7	do.
Gum and Extractive	2.1	do.
Sugar ? soluble in Alcohol	0.1	do.
Loss	0.353	do.
	7.25	

---

* Curtis's Entomology. † Notes of a Naturalist, 1832.

CULTURE OF THE CINNAMON TREE.

(Cinnamomum Verum.)



As this plant is considered by many persons hard to cultivate, it will be well for all who possess plants to follow the few simple undermentioned rules, which will render it as thrifty and easy of cultivation as most other stove plants.

1. Never plunge the pots in which the plants are grown into bark or any other substance that will communicate much moisture to the roots, or the fleshy fibres are liable to be destroyed. It is therefore advisable not to plunge the pots at all.

2. Never allow the heat of the house in which the plants are grown, to fall below 65 degrees, Far., either in winter or summer.

3. The soil in which they appear to thrive best, is a mixture of equal parts of sandy loam and peat.

4. Always pot as often as the roots fill the pots, and never allow them, if possible, to mat closely, or the plants will suffer materially.

5. In potting, never pare the roots off with a knife, but if any have become matted, merely loosen them with a pointed stick, and shake off a little of the old soil; but if not matted, only remove the potsherds from the bottom of the ball and place the plants carefully into a larger pot.

6. Always give a good drainage: lay a large piece hollow on the hole at the bottom of the pot, then place about an inch thickness of broken pot, and over this lay a few fragments of rough turf, to prevent the soil from washing in or stopping the course of the water.

7. The plants may be propagated by cuttings as follows: As soon as the young wood is thoroughly ripe, take off the cuttings about six or eight joints long, trim off the lower leaves from the part which is to be placed in the soil; when prepared, plant them in a pot of sand, and plunge the pot in a tan bed or other moist heat, and cover them with a bell glass.

8. In watering, never allow the soil to become saturated or sodden, only supply when the soil has the appearance of dryness.

OPERATIONS FOR JULY.

Auricula seed should be sown as soon as ripe, and the plants from which it was gathered, be potted, page 10, rule 9.

Azaleas should now be propagated by cuttings of the young wood, planted in sand under a hand-glass.

Carnations.—Transplant, seedlings six inches apart, in an open airy situation, in fresh light earth. The flowering plants may also be layered, or pipings planted under a hand-glass, page 67.

Calceolarias.—Cuttings may still be planted in sandy peat and covered with a hand-glass, also the old plants should have a top-dressing.

Dahlias may yet be propagated by cuttings. The old plants will also require staking, page 106, rule 27.

Green-house Plants of most sorts may be propagated by cuttings; those in pots standing out of doors will require a good supply of water.

Late Annuals.—Hardy annuals sown now come into flower the end of September, page 19.

Lemon and Orange Stocks may be budded about the end, if the bark will rise freely, page 93, rule 15.

Ranunculuses, &c. now being out of bloom, and the tops dead, must be taken up and spread in a dry airy situation previously to being laid by, page 44, rule 10. Roots now planted will flower in October, page 45, rules 11 and 13.

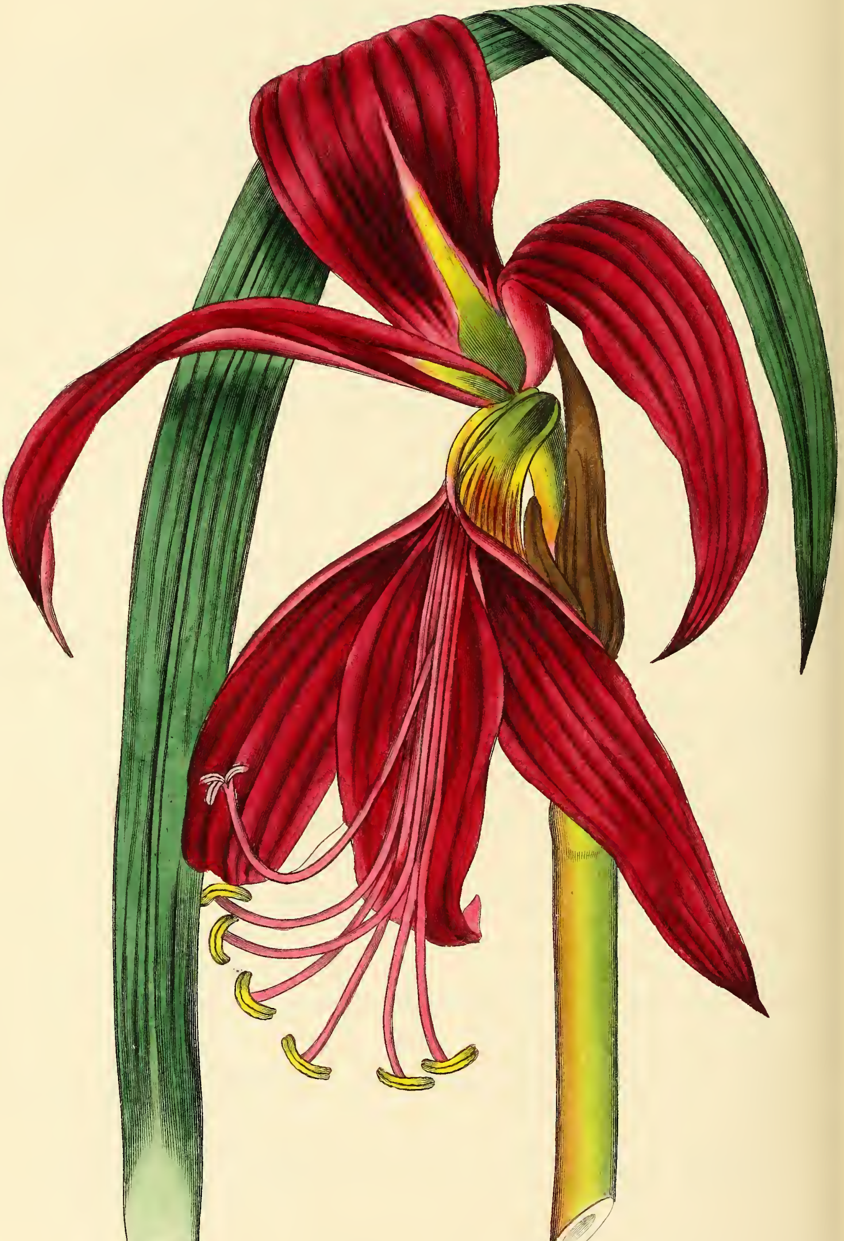
Rockets.—When out of flower, cut down the stems nearly to the ground, to induce shoots to grow for cuttings, page 108, rule 1.

Rose Acacias, having their shoots shortened early in the month, will push anew, and flower again in the autumn.

Rose Trees should now be budded. Those trained on trellis infested with the aphis, should be syringed with a mixture of tobacco-water, and clear lime and soot-water.

Tigridia pavonia.—Seedlings transplanted on a hot-bed may now be fully exposed to the air, page 85, rule 5.

Violets may be readily increased by the young shoots, which are plentifully striking roots at this time, page 115.



Amaryllis formosiſsima

AMARYLLIS FORMOSISSIMA.

(CRIMSON JACOBEA LILY.)

CLASS.
HEXANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
AMARYLLIDEÆ.

GENERIC CHARACTER.—*Flowers* nodding. *Corolla* a perianth in six parts, campanulate or rather funnel shaped. *Stigma* three-lobed. Seeds flat and numerous.

SPECIFIC CHARACTER.—*Bulb* roundish. *Leaves* nearly half an inch broad, and usually from ten to twelve inches long, ending in a sharp point, having a channel down the centre. Scape single flowered or rarely double. *Perianthium* highly coloured, divided into six segments of a rich crimson colour, and somewhat green at the base; three upper segments bent back; tube scarcely any. *Stamens* six, inserted at the base of the perianthium, and included in the three lower segments.

SYNONYMS.—Indian daffodil with a red flower, *Park.* Lilio-Narcissus Jacobeus, *Dillen.* Sprekelia formosissima, *Sweet's Fl. Gard.* *Herbert's Append.*

ALTHOUGH this plant is a very old inhabitant of our gardens, yet its exquisite beauty certainly merits our attention, and, amongst a selection, this ought by no means to be lost sight of. It is a native of South America, and was introduced in 1658. It endures our winters pretty well in the open ground in warm situations, as under a south wall or bank side where it is sheltered from the winds. It should be planted about three or four inches deep, and, when the bulb is torpid, should be sheltered from excessive wet or frost. But the best plan for those to adopt who grow it out of doors, is to take up all the bulbs and dry them as soon as the leaves have decayed, and plant them out again early in the spring. They are most usually grown in pots, and kept in the greenhouse, where they make a splendid show from the end of April until June.

GILIA TRICOLOR.

(THREE COLOURED GILIA.)

CLASS. PENTANDRIA. ORDER. MONOGYNIA.

NATURAL ORDER. POLEMONIACEÆ.

GENERIC CHARACTER.—*Calyx* membranaceous, smooth or covered with downiness, in five parts. *Corolla* somewhat funnel-shaped, five-parted. *Stamina* inserted on the inner side of the corolla. *Capsule* three-celled.

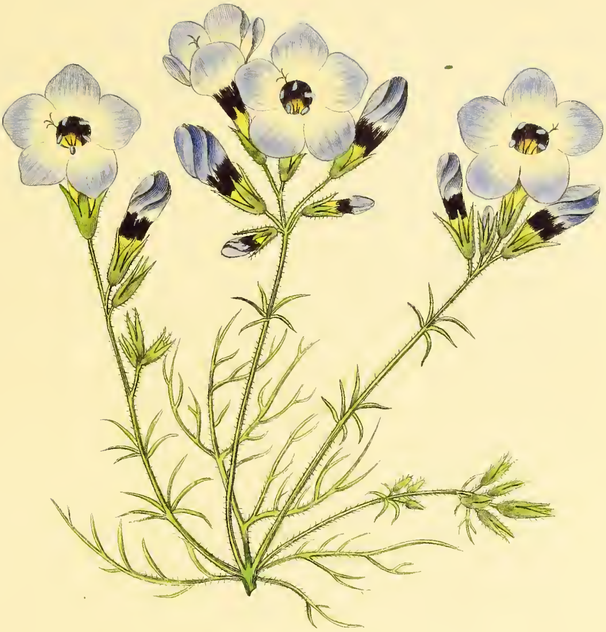
SPECIFIC CHARACTER.—*Plant* annual. *Stem* erect, covered with short glandular hairs. *Leaves* alternate, bright green, shining, pinnatifid, covered with hairs towards the base, at the extremities nearly smooth. *Flowers* growing in pairs, hanging somewhat loosely, seldom forming a compact head. *Calyx* shorter than the tube of the corolla, covered with downiness. *Corolla* light purple towards the edges of the segments, becoming nearly white as it approaches the tube; throat of the tube dark purple, forming a broad circle just above the segments of the calyx; base bright yellow. *Stamina* about half the length of the corolla.

GILIA ACHILLEÆFOLIA.

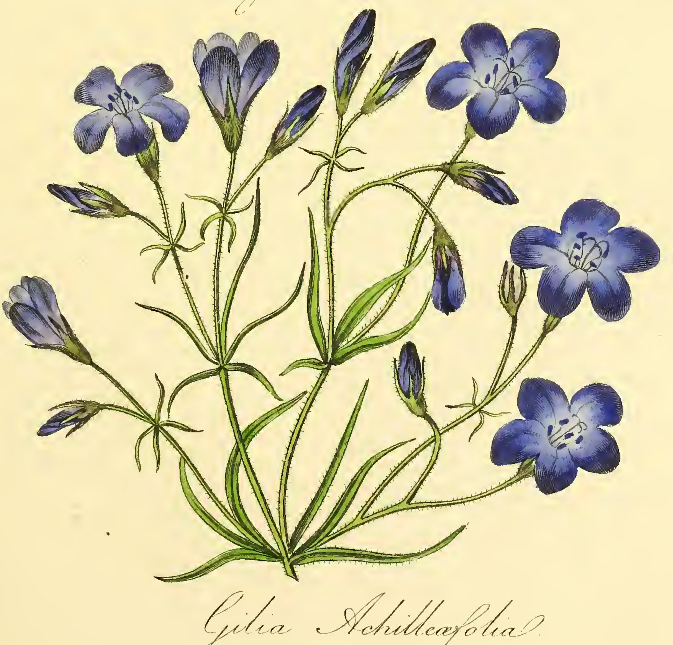
(MILFOIL-LEAVED GILIA.)

SPECIFIC CHARACTER.—*Plant* annual. *Stem* erect, hairy. *Leaves* alternate, pinnatifid, covered with hairs towards the base, and nearly smooth at the extremity. *Flowers* growing in corymbs, more dense than those of *G. tricolor,* but nothing like the *G. capitata.* *Calyx* shorter than the tube of the corolla, downy. *Corolla* bright purple. *Stamina* half the length of the corolla, inserted within the throat of the tube.

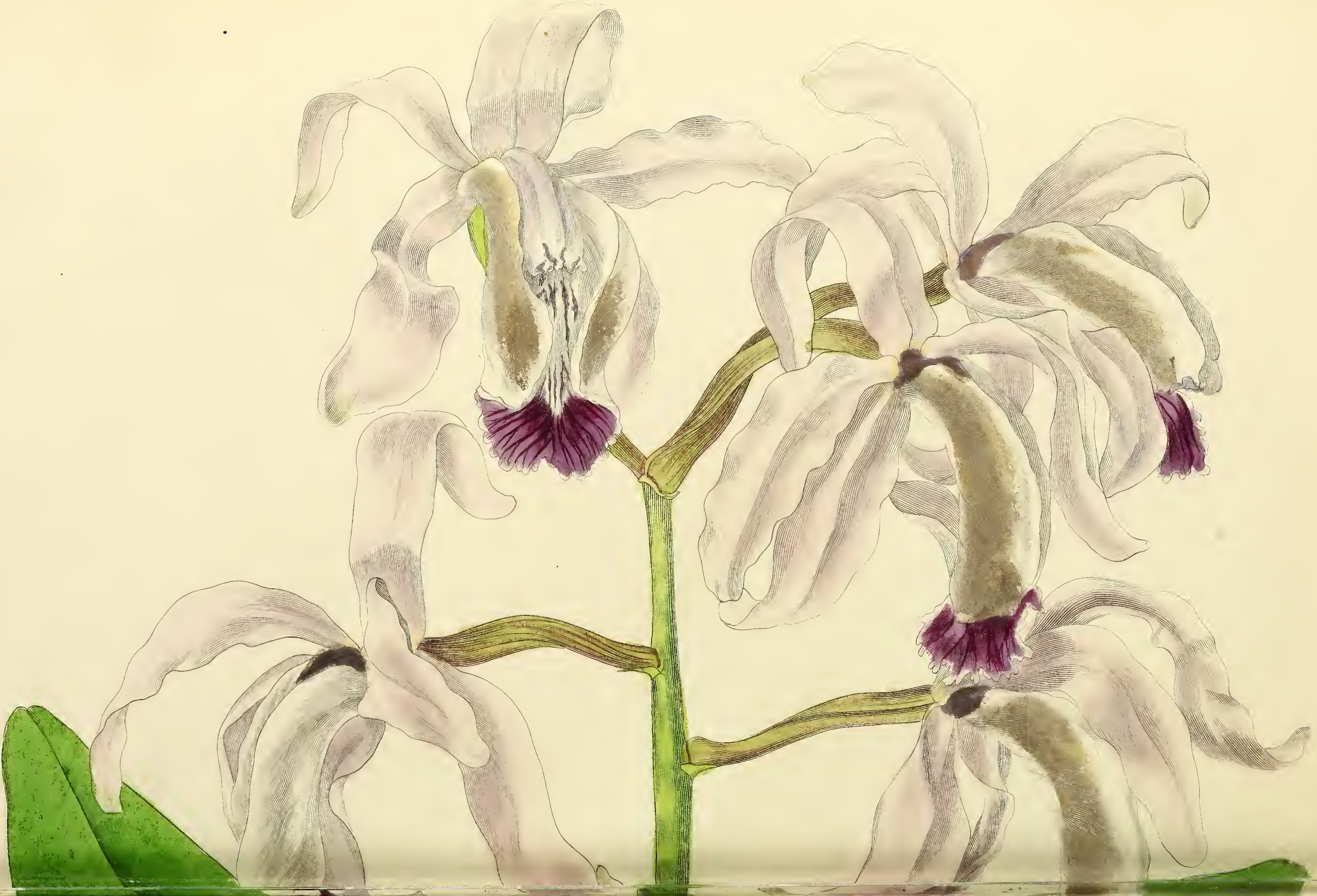
THESE two new hardy annuals are natives of California, and have been lately sent from thence to the Horticultural Society by Mr. Douglas. They will thrive in any kind of light soil, and require treating in the same manner as other hardy annuals. Our plants at Chatsworth are now blooming very freely, both in the open borders and in pots, and have been for some time. They promise to produce abundance of seeds, and will therefore probably become common in a short time. We made our drawings in the beginning of June, and, from the supply of flowers still in advance, we anticipate they will continue to ornament our borders until late in the autumn.

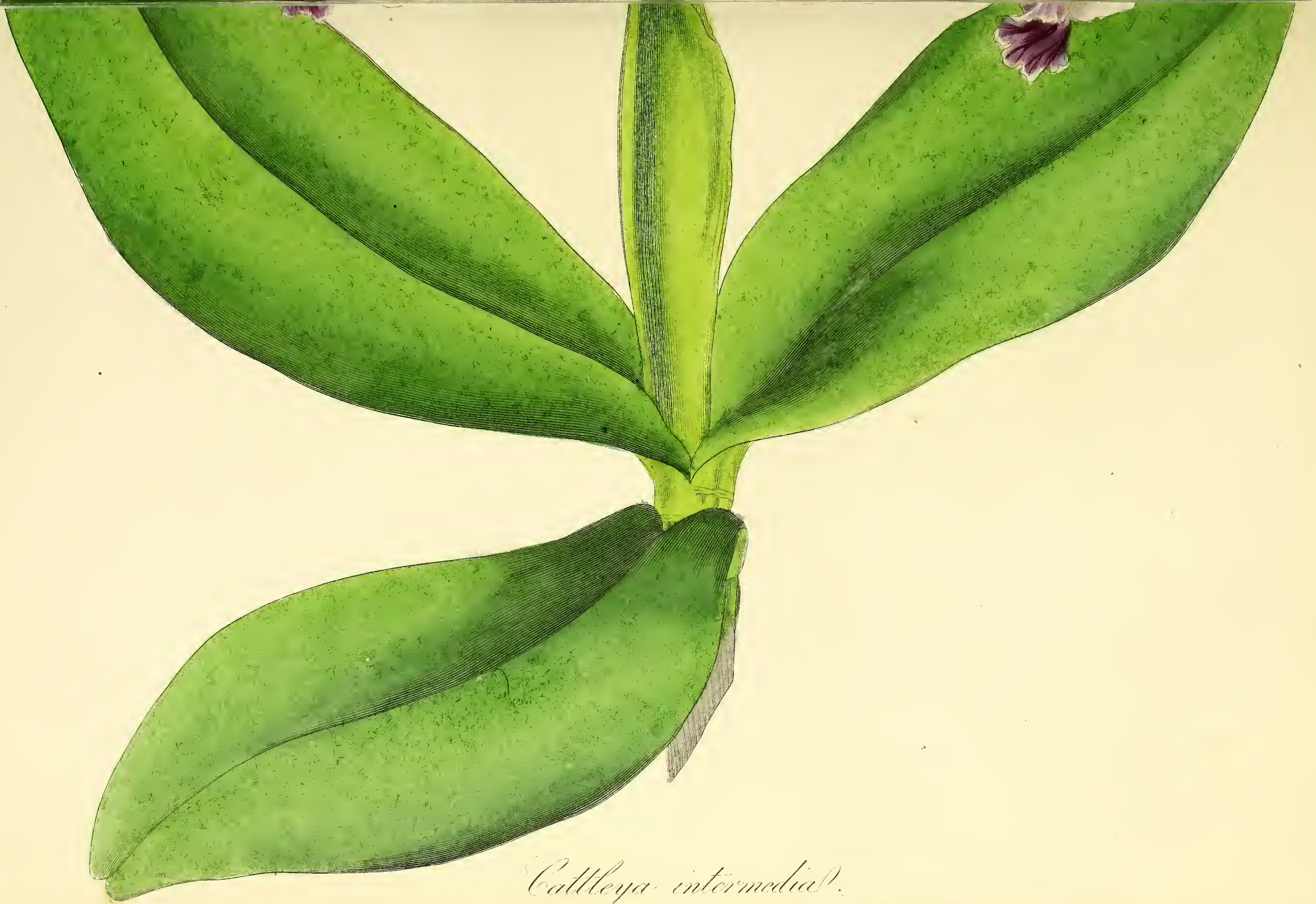


Gilia tricolor

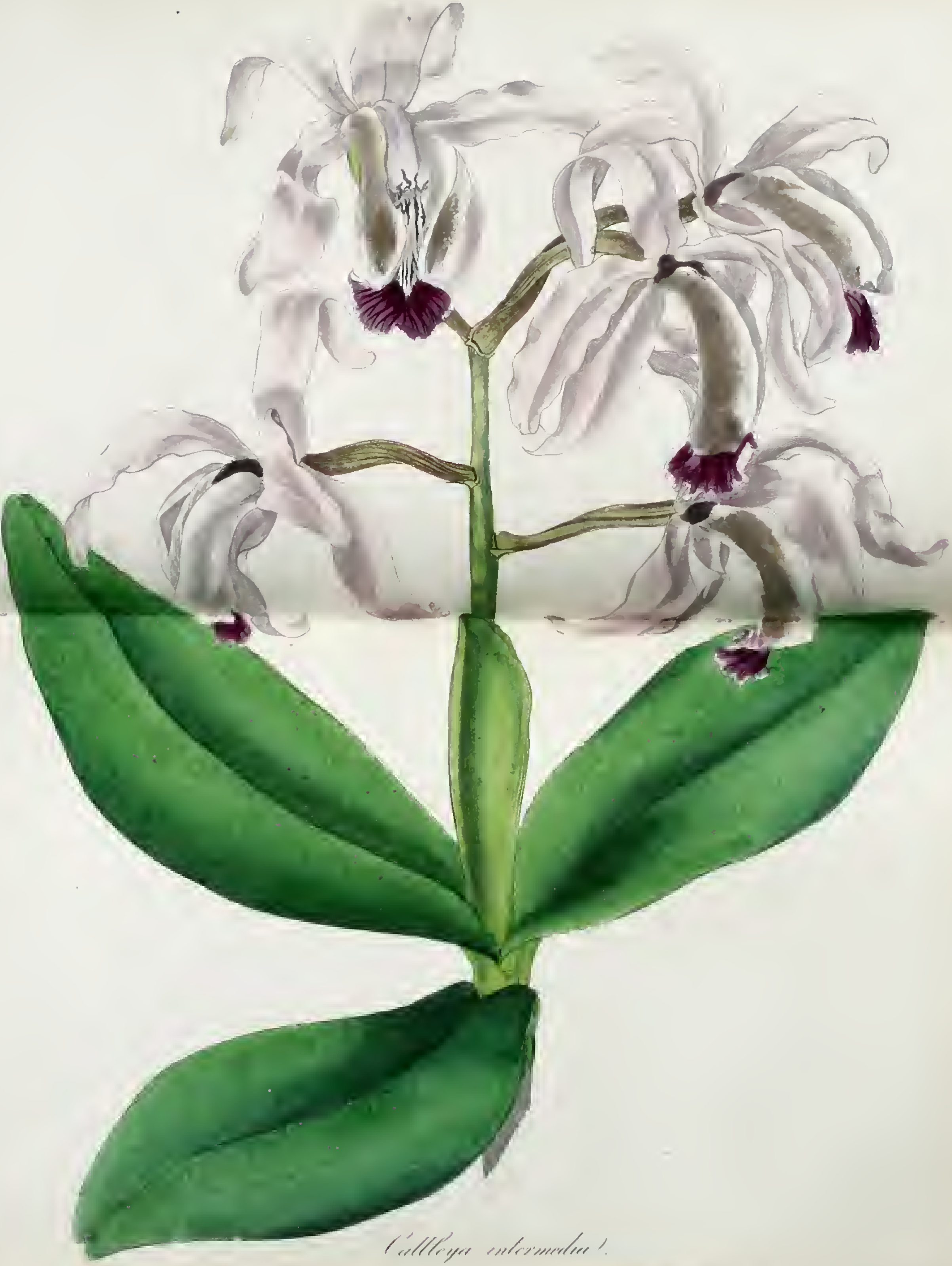


Gilia Achilleæfolia





Cattleya intermedia.



Cattleya intermedia!

CATTLEYA INTERMEDIA.—GRAHAM.

(INTERMEDIATE OR MIDDLE-SIZED FLOWERED CATTLEYA.)

CLASS.	ORDER.
GYNANDRIA.	MONANDRIA.

NATURAL ORDER.
ORCHIDEÆ.

GENERIC CHARACTER.—*Sepals* spreading. *Column* of fructification, half round. *Labellum* hollow, clasping the half round column. *Pollen Masses* four, in two pairs.

SPECIFIC CHARACTER.—A Parasite. *Stems* numerous, jointed, nearly free from furrows, terminated by two dark green flat leaves from four to six inches long. *Spathe* rounded at the top, of a light green colour. *Flower stalk* smooth or nearly so, supporting from one to five flowers. *Sepals* nearly equal, of a delicate light rose colour, terminating in a point. *Lip* about two inches long, somewhat paler than the sepals, forming a considerable curve downwards. *Column of fructification* about half the length of the lip which clasps it, rose colour, streaked with purple.

FOR the figure of this truly splendid Orchideous plant, we are indebted to the kindness of Mr. Cooper, gardener to the Right Honourable the Earl Fitzwilliam, under whose judicious and excellent management the valuable collection of orchidea at Wentworth House are grown to very great perfection. The present plant flowered in June, when our drawing was taken.

According to Dr. Graham, in the Botanical Magazine, 2851, specimens of this plant were first brought from Mr. Harris, of Rio Janeiro, by Captain Graham, in 1824. In general habit it bears a close resemblance to *C. Forbesii*, but differs in the colour and size of the flowers.

The general mode of culture is as follows:—

1. Never allow the temperature of the house in which they are grown to be less than 75 degrees, nor greater than 95 degrees Fahrenheit.

2. It is indispensable that the atmosphere of the house be kept excessively moist it is all the better if it nearly reaches the point of saturation, as no heat, soil, or care will make the plants flourish in a dry air. No dry country, however hot, suits their habits, and therefore none are ever found naturally growing in such situations, whilst in the woods of Rio Janeiro, where the air is humid, and the temperature high, they are found in abundance.

3. Never suffer the plants to be exposed to dry parching winds, but if possible give air through ventilators, so situated as not materially to affect the humidity of the house, or come in contact with the plants.

4. Shade is essential to their welfare, therefore never permit them to be exposed to violent sunshine: if the sun be powerful, throw a woollen net over the glass. Any slight shade occasioned by creepers, or anything which will not darken the house too much answers the purpose.

5. They require but little water at their roots, providing the atmosphere in which they grow is very humid. Carefully avoid sprinkling water on the leaves, as many species of orchidea have been found to receive great injury from the practice. It is always requisite that the water used should be of the same temperature as the house in which the plants grow.

6. The best sort of soil for them is a sandy peat, containing as large a portion of fibres as possible, mix with this about one-third of broken potsherds, and be careful not to place the plant too deep in the pot. They will grow also on a piece of rotten wood, set or hung up in the stove. In this case they merely require a little moss tying round the bottom of the stem, to facilitate the growth of the roots, but this is not to be recommended for general practice.

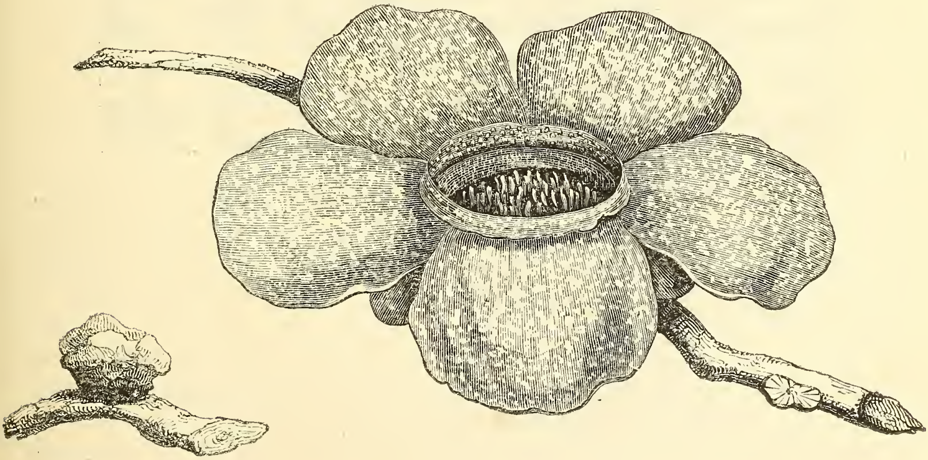
7. In potting always be careful to give a good drainage; this may be done by filling about one third of the depth of the pot with broken potsherds. Although the plants are fond of moisture, they never thrive, except the water has a free passage through the pot.

RAFFLESIA ARNOLDI.

Among the multitude of curious, rare, or valuable objects of botanical interest which have of late years become captive to the industry and persevering researches of our countrymen, few, if any, have approached the singular plant which bears the above title. It is very true that many of the plants of which we have long been in possession, as well as those of more recent introduction, present fairer features or greater delicacy of structure to the eye of the florist or botanical collector, but for magnitude of dimensions and grandeur of design, they must yield the palm to this truly astonishing ornament to the phænogamous tribe. It was found at Pulo Lebbar, on the Manna River, by Dr. Arnold, an eminent naturalist, during a journey with Sir Stamford Raffles from Bencoolen into the interior, in the year 1818, and is known by the natives under the names of *Krûbût* and *Ambun Ambun.*

Its diameter proved on measurement to be fully three feet, and the nectarium was supposed to be capable of containing a gallon and a half; from the centre of this latter portion of the flower rose a large pistil terminating in about 20 points, rather curved, and resembling small horns.

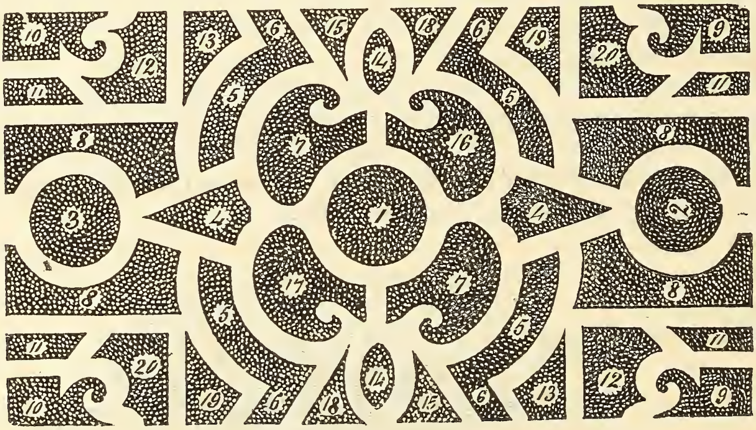
In this country it exists only in the shape of models, a few of which were made from the remnants of the original flower preserved in spirits, and from coloured drawings taken at the time of its discovery. In these models it is represented as attached to the stem of a species of *Vitis,* on which or on the *Cissus angustifolia* it grows parasitic. The annexed is a sketch of it.



PLAN OF A GEOMETRICAL FLOWER-GARDEN.

It is our intention occasionally to insert plans of flower-gardens, either such as have been furnished by our friends, or designs of our own, as occasion may offer. The present one was sent us by Mr. Brown of the gardens at Stowe, the seat of his Grace the Duke of Buckingham, and which is only calculated for certain situations.

When the disposition of the ground will admit, the French parterre, or geometrical flower-garden, is above all others the most to be recommended, because of its readily admitting the greatest variety of flowers throughout the season. There is scarcely any difficulty in producing a splendid show once or twice in the year, spring and autumn; and in consequence of many gentlemen not residing all the summer months near their flower-gardens, the gardeners have additional advantage in such places, to produce at the time required the best display of flowers. Where a constant supply is required, much care and attention are also necessary.



The parterre affords the greatest facilities. Planting in masses produces the most imposing effect: arrangement of the beds, and contrasting of colours, is the chief thing to be considered; succession of plants is also indispensable; the propagating by cuttings, seeds, &c., and keeping in reserve to turn out when a bed is ready to receive them.

If there is no green-house, cold frames will answer for wintering almost every requisite plant for the flower-garden in the spring, provided the glass be covered with matting sufficient to prevent the frost entering; frames will be required to raise the tender annuals in the spring. Such a plan would look best, with gravel walks and box edgings in front of a conservatory, green-house, or dwelling-house.

In planting the beds, much depends on the taste of the proprietor, with regard to his favourite flowers; yet I conceive that if planted in the following manner, they would give general satisfaction.

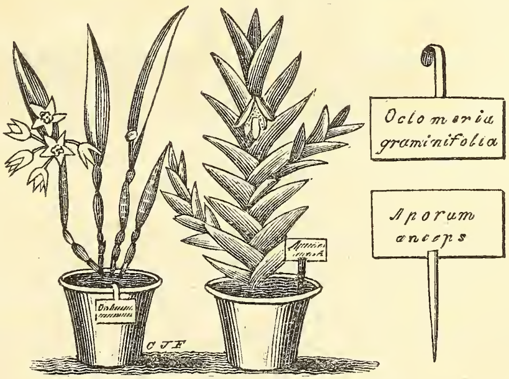
Supposing the ground-work finished according to the annexed plan, the scale of which must be adapted to the quantity of ground occupied.

Plants occupying the beds in Spring.—1, Hyacinths of sorts; 2, Tulips of sorts; 3, Narcissus of sorts; 4, Viola of sorts, standard rose; 5, Crocuses of sorts; 6, Viola of sorts; 7, Herbaceous plants and roses; 8, Hyacinths of sorts; 9, Ranunculus of sorts; 10, Anemones of sorts; 11, *Mathiola annua*, scarlet and purple, turned out of pots; 12, Herbaceous and annuals; 13, *Mathiola annua*, scarlet and purple, turned out of pots; 14, Viola of sorts, standard rose in centre; 15, *Ænothera macrocarpa;* 16, Ranunculus, bordered with snowdrops; 17, Tulips, bordered with snowdrops; 18, *Mathiola annua*, scarlet and purple, turned out of pots.

Plants, in Summer and Autumn.—1, Choice Dahlias of sorts; 2, do. do.; 3, do. do.; 4, *Verbena Melindres,* standard rose; 5, Calceolarias of sorts; 6, *Fuschia gracilis* and *microphylla;* 7, Herbaceous plants and roses; 8, *Heliotropium Peruvianum* and scarlet Pelargoniums; 9, *Salvia fulgens* and *splendens;* 10, *Salvia fulgens* and *involucrata;* 11, *Lobelia, erinus* and *albus*, standard rose; 12, Herbaceous plants and annuals; 13, *Mathiola annua,* sown in spring; 14, Viola of sorts, standard rose in centre; 15, *Ænothera macrocarpa;* 16, *Campanula pyramidalis* and *Lobelia fulgens,* mixed; 17, *Campanula persifolia* and *Lobelia splendens;* 18, *Mathiola annua,* scarlet and purple, sown in spring.

THE USE OF PLATE OR ROLLED ZINC FOR TALLIES.

A SHORT time ago a notice from a friend reached our hands, wherein he stated that plate or rolled zinc answered well for tallies. The *Zinc* being very porous, the ink sinks so deep into it, as to withstand the rain and weather for a long time; indeed, the writing can scarcely be effaced without washing with a weak acid, as cream of tartar, or an apple, &c. &c. The name is merely written with a common pen and ink, and afterwards run over the writing a little boiled linseed oil, which will prevent it being defaced. The labels may be clipped to any pattern and stuck upon a stick, or hung upon the side of the pot. The plants in the engraving are—

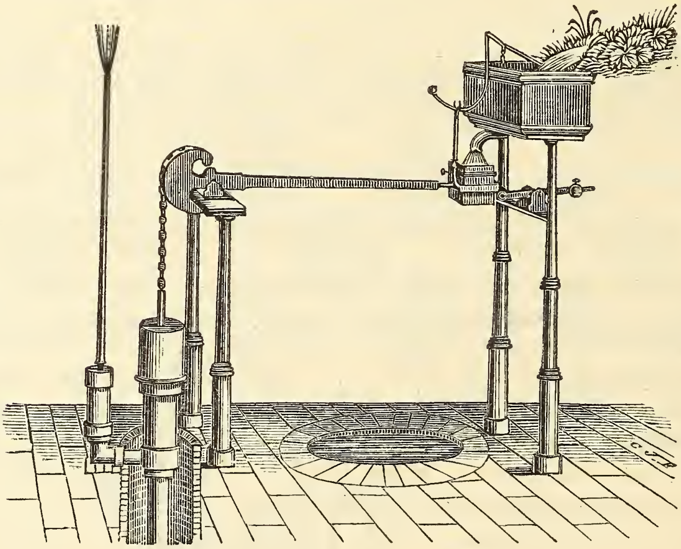


Aporum anceps—" An orchideous plant, a native of the swamps of Bengal and Pegu, where it grows on the trunks of trees. It succeeds in a very moist atmosphere, suspended in the stove with moss and fragments of broken pots, and will increase by cuttings."—*Bot. Cab.*

Octomeria graminifolia—Another orchideous species, "a native of the West Indies. It has been kept in the stove, and grows pretty well in moss, with pieces of broken pots, and may occasionally be increased by separation."—*Bot. Cab.*

LUCAS'S SELF-ACTING FORCE AND LIFT PUMP FOR RAISING WATER.

This machine is stated to be an excellent contrivance for supplying gentlemen's houses, gardens, reservoirs, farm-yards, &c. &c. with water, where, from their elevated situations, it would otherwise be difficult to obtain. It may be fixed in all situations in which a small supply of water can be procured; its construction is very simple, and not liable to be out of repair; yet, should that happen, it may be readily adjusted. The appendages can be attached to any description of pumps, whether such as are already fixed or otherwise. The waste of water is very trifling, a very small supply being sufficient to work it, which, if requisite, can also be raised. The ingenious inventor resides at No. 1, Edmund Street, Newhall Street, Birmingham. We have not yet had the pleasure of seeing it act; but a friend of ours, who is in the habit of frequently seeing it, pronounces it a most valuable invention.



CULTURE OF THE ALOYSIA CITRIODORA OUT OF DOORS.

This plant will grow to the size of a large gooseberry bush in the open borders, with very little care and attention.

1. Let the soil in which it is planted be light sandy loam, and well drained.

2. Always select a situation sheltered from the north and east or west winds, and where the plant can receive the benefit of the sun through the greater part of the day.

3. If a situation on the open borders so sheltered cannot be obtained, place the plants against a wall facing the south, and train them to it.

4. Just when nature begins to show an inclination to push her buds, cut down the last summer's wood to three or at most four eyes; by so doing the plants will be kept within due bounds for many years, and at the same time will produce abundance of young wood either for propagation or to mix with nosegays.

5. In severe weather during winter it will be necessary to fix a mat round the plant, after the manner of matting currants in summer, except that the mat in this case must also cover the root, which should be previously mulched with a little half-rotted dung. If the plant be trained against a wall, this covering can very easily be effected by nailing a mat over it.

6. *Propagation.* When the young shoots are grown about three, and not on any occasion more than four, joints, they may be slipped off from the places where they were first started; take off the leaves half way up or more, then with a sharp knife cut a section straight across, just at or below the bottom joint.

7. The cuttings being thus prepared, plant them in pots filled with equal parts of light loam, peat, and sand sifted fine, and place a small bell glass over them if convenient, but, if not, they will grow freely without, but do not strike so speedily.

8. If the pots are placed in the front of a melon or cucumber bed, the heat will greatly facilitate their striking; but when this cannot be had, place the pots under a hand-glass out of doors, in rather a shady situation.

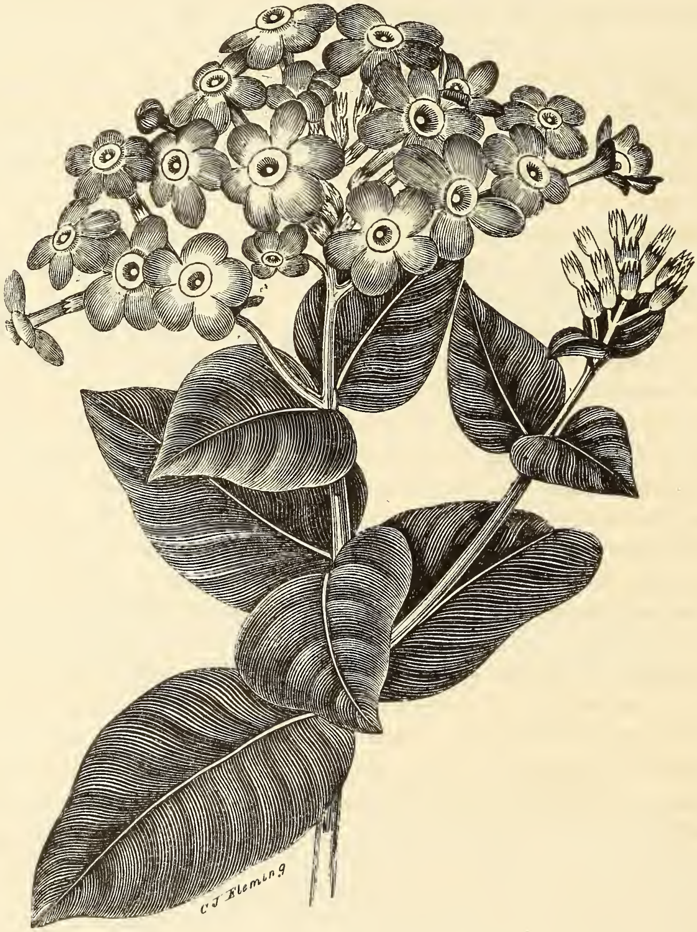
9. For the first week after being put in, let them be carefully shaded from the sun by ten o'clock in the morning, and keep them so until four in the afternoon, but afterwards gradually increase the quantity of sun until they have struck root.

10. When rooted, pot them in small pots, or plant them in the open borders, as recommended for old plants.

11. Give them a good supply of water in dry weather during summer, but whilst dormant in winter much moisture would materially injure them.

CULTURE OF THE GENUS RONDELETIA.

All the species of Rondeletia are natives of tropical countries, and therefore require a good degree of heat. They are very ornamental shrubs, particularly a new species introduced by Messrs. Loddiges, through W. J. M‘Leay, Esq., in 1830, and called the *R. speciosa*. According to those gentlemen, who have given an excellent figure of it in the Botanical Cabinet, the orange-red flowers are exceedingly



rich, growing in corymbs, and making a most striking appearance, being quite as splendid as the *Ixora coccinea*, if not more so.

1. All the species require the heat of the stove, and will not thrive in any situation with a temperature less than 60 deg. Fahr., but they flower much finer if regularly kept in a house where the general heat is 70 deg. or more.

2. The soil most suitable for them is a light sandy loam, mixed with at least one half of sandy peat.

3. In potting, always give a good drainage with broken pots, in preference to cinders, stones, or any other materials.

4. Always be careful never to over-pot them, but use small pots, and pot them oftener. The best time for them to be generally potted is immediately after they have done flowering, and, if needful, about two months before they come into flower again.

5. Never pare off the matted roots with a knife, but if necessary loosen them a little at the time of potting, with a pointed stick, or the hand, and carefully place them in the new pot.

6. At the time of flowering, give a good supply of water at the roots ; and, during summer, sprinkle water over the leaves also, about once or twice a-week.

7. They are propagated very freely by cuttings of half-ripened wood taken off at three or four joints, and planted in clean sand, and plunged in heat.

8. It is necessary they should be covered with glasses ; a cheap and good substitute for the common crystal bell glasses, is flat pieces of common crown glass laid over the top of the pot in which the cuttings are planted ; fill the cutting-pots to within something more than the height of the cuttings from the top of the pot, to allow room for their growth whilst striking. The sides of the pots act as a sufficient shade, and turning the glasses upside down every morning prevents the condensed vapour upon the glass injuring the cuttings. Mr. Mearns, gardener to his Grace the Duke of Portland, first recommended this system in our Horticultural Register, and he found it to answer so well, that he greatly prefers it to any other covering. There is no occasion to *waste* the glass by cutting it circular, or even to cut off the corners, and the pane may be used for glazing purposes when it is done with.

9. When the cuttings are rooted, pot them off in small pots filled with sandy peat, and at each succeeding potting add a little loam, until the compost is in the proportions recommended for flowering plants.

10. After the cuttings are potted off, for the first time, plunge the pots again in a brisk heat, until they have begun to make roots, when they may be treated like old plants.

CULTURE OF THE GENUS GAULTHERIA.

The species of this genus are ornamental, and well deserving of cultivation. The *G. Shallon*, though small in this country, grows to a considerable size in its native woods. Mr. Knight's observations on the habits of this plant were kindly furnished us some time ago by Dr. Bevan, which we will here insert. "I have obtained a shrub," says Mr. Knight, "from the west coast of North America, the blossoms of which contain more honey, and I think of finer quality, than I have observed in any other. The blossoms are very similar to those of the *Arbutus*, a plant to which it is very nearly allied, and the trees are a good deal similar in form and stature, though I think the *G. Shallon* rather more nearly resembles the *Laurustinus*. Each flower appears to contain as much honey as the honey-bee usually carries home at once. The plant is supposed to be perfectly hardy, and is propagated by slips and by seed, to any extent, without trouble. It grows under the shade of trees in North America, and will probably bear a good deal of shade in our climate. It is a very ornamental plant, and bears a fruit very similar in form to a bilberry, which it resembles in colour, but is as large as a middle-sized grape; and Mr. David Douglas, who brought it home to the Horticultural Society, assured me that it is very sweet and palatable. He himself at one time lived wholly upon it for three days and a half." It is propagated best by layers.

The *G. procumbens* is an evergreen creeper, and may be readily propagated by suckers.

There are two greenhouse species, the *G. fragrans*, and *antipoda*, which propagate freely by layers, or cuttings, planted in sand under a bell-glass, and plunged in a slight heat.

All the species should be planted in sandy peat earth, or in the absence of that, very light loam mixed with a large portion of sand.

CULTURE OF THE TULIP.

The Tulip is considered to be a native of the Levant, and is very common in Syria and Persia, and, according to Gesner, was brought to Europe in 1559, and was cultivated in England by James Garnett, as early as 1577. Towards the middle of the seventeenth century, it became an object of particular interest in the Netherlands; nay, to such a height had the passion for tulips arrived in 1637, that at a public auction, which took place at Alkmaar, 120 tulip roots were sold for no less a sum than 7875*l.*, and one sort alone, called the Viceroy, cost the purchaser 190*l.*

The taste for tulips in England appears to have arrived at its climax about the end of the seventeenth and beginning of the eighteenth centuries, and they still remain flowers of considerable value amongst florists, for, according to Mr. Hogg, a moderate collection of choice bulbs cannot now be purchased for a much less sum than 1000*l.* at the usual prices.

Tulips are divided by florists into three classes, viz. 1st, *Bybloemens*, such as have a white ground, variegated with purple, the edges well feathered, the leaflets of the perianthium erect, and the whole forming a well shaped cup, as Bienfait, Washington, Incomparable, Baguet, &c. 2nd, *Bizarres*, having a yellow ground, variegated with scarlet, purple, rose or velvet, well feathered round the edge, as Catafalque, Trafalgar, Duc de Savoie, &c. And 3rd, *Roses*, with white ground, variegated with rose colour, scarlet, or crimson.

The methods of propagation are by seeds for new varieties, and offsets to perpetuate the old. When it is wished to propagate by seed, always—

1. Select such plants to produce it as have good strong stems, with well formed cups, and the most perfect flowers in colour, as Trafalgar, Incomparable, Bienfait, Surpasse, Catafalque, Walworth, &c.

2. The plants thus selected should always be exposed to the weather, as shading will prevent the seed coming to proper perfection.

3. Always allow the seed to remain on the stem until the seed-vessels open, and in gathering cut off about six inches of the stem with the head, and spread the whole in a situation where they gradually dry.

4. The best time to sow these seeds is in October. For this purpose, take some shallow pans or boxes, and fill them with light sandy loam, making an even surface to receive the seeds, which must be covered about half an inch deep with light soil, mixed with about one-third of rotten horse-dung, and they will be up in March the following year.

5. As the bulbs are very small the first year, the leaves will die about the beginning of June: it is necessary to allow them to remain in the boxes without being disturbed for two years. They are in general five or six years from the time of sowing before they flower. After the second year they will require taking up, and planting in good new soil every season.

6. *Offsets.*—Always separate the offsets previous to the bulbs being put away in the case or bags, and carefully keep each choice sort to itself.

7. In November plant the offsets which are not likely to flower in a bed to themselves, after the same manner as that recommended below for old roots, except that they need not be planted so far apart; three inches are sufficient.

8. *Flowering beds.*—The situation of the beds for full-grown flowering bulbs should always be in an open, airy part of the garden. Take out the common soil the full dimensions of the bed, to about the depth of eighteen inches, and fill up the place with good sandy loam, from an old pasture (which should be dug at least four months before it is used), mixed with a small portion of well-rotted horse-dung, at least two years old.

9. Always raise the beds not less than three inches above the paths at the outsides, and six inches to a foot in the middle of the bed; this convexity will render it more capable of casting off the water in times of heavy or continued rain.

10. The bed being thus formed, the next thing is to proceed to planting. The best time for doing this is in the beginning of November.

11. Plant the bulbs in rows lengthwise on the bed. A bed 4 feet wide will contain seven rows, allowing the two outer rows to be six inches from the sides of the bed; this will allow each row to be six inches apart, and the bulbs may be planted the same distance in the rows.

12. In planting, always make it a rule to place a little fine sand in each hole before introducing the bulb; this greatly assists the bulb. The depth they must be planted is about four inches.

13. After being planted, but little attention is required until the latter end of February, when most of them will appear above ground; they must then be carefully examined, and if either leaves or bulbs are injured by the canker, the part affected must be carefully taken off, choosing a fine dry day for the purpose; and if the wounded part be left exposed to the sun and air, it will presently heal.

14. When the flower buds make their appearance, great care is necessary to shelter them from hail storms, heavy rains, and frosts; this may be done by round pieces of board about twelve inches in diameter, having a stick passed through the centre of each board. These being stuck in the bed by the side of the bulb, will form a cap over the top of the flower-bud which can be raised higher at pleasure. This has been found by experience to be far better than covering the beds with either hoops and mats or awnings, until the flowers are more advanced, for by following either of the latter means the stems are apt to become weakly, and be scarcely able to support the flowers.

15. When the colours of the flowers begin to show, cover the bed with an awning, as their exposure to either sun or rain would cause the colours to run and mix, and by this means spoil the beauty of the flowers; but as soon as the flowers begin to fall, the sheet must be removed, and all the seed pods broken off, which will greatly strengthen the bulbs.

16. As soon as the upper parts of the stems become withered and dry, and the foliage yellow, commence taking them up. Lay them on boards under cover in a dry, airy situation; and when perfectly dry and clean, put them away either in paper bags or in a bulb case, like that recommended for the Ranunculus.

The Duc Van Thol tulip may be forced in pots or water-glasses, treated in the same manner as is usually done for hyacinths.

CULTURE OF THE GENUS BRUNSVIGIA.

The whole of this beautiful genus flowers most of the summer, and the bulbs grow to a considerable size; therefore

1. Always be careful, if the plants are grown in pots, never to allow the roots to be cramped in too small a compass, for they never thrive under such circumstances.

2. The best soil is light turfy loam mixed with equal parts of peat and sand, chopped and well mixed together, but not sifted.

3. Always plant the bulbs very shallow, or they are liable to be injured, if not destroyed, by the water given during the time of their growth, and particularly just when they are starting in spring.

4. When planted, place them in a warm part of the greenhouse; if the cultivator has no greenhouse, a frame will answer the purpose, or even a warm situation out of doors, providing they are protected from dashing rains and excessive cold.

5. Although at the time of flowering they are entirely destitute of leaves, yet they require a pretty liberal supply of water; this should not be thrown carelessly on the bulb, but be poured carefully upon the dry soil in the pots.

6. When the flowers are dead, and the leaves begin to grow, remove the pots into a hothouse if convenient, and let them remain there, giving a moderate supply of water until the bulbs are perfected. If it is inconvenient to remove them to a hothouse, keep them somewhat warmer than previously, in a frame; this increase of heat is indispensable for good success, for unless the leaves be assisted in their growth, the future flowering of the bulbs will be weakened, if not wholly prevented.

7. When the bulbs are nearly perfected, which will be known by the leaves beginning to die, decrease the quantity of water until the leaves are quite dead, then withhold it altogether.

8. When the bulbs are quite perfected and the leaves dead, remove the pots to a cool part of the greenhouse or other convenient situation, and keep them perfectly dry, until the time to start them again, when they must be turned out of the pots and be replanted in fresh soil as before, always being careful to give each pot a good drainage with potsherds.

9. The proper season for repotting those which flower in April and May, is February or the beginning of March at latest; for those flowering in June and July, March or the beginning of April; for those flowering in August and September, about the end of April.

10. Those persons who possess neither frames nor greenhouses, may plant the bulbs in the open borders in spring. It is necessary, however, that the soil should be light and the situation warm.

11. In planting out of doors, always put a small portion of sharp white sand in the hole round and underneath the bulb.

12. As soon as frosty weather commences in the autumn, take up the roots, with soil about them, and place them in pots, and set the pots in the house or any place where they can remain dry and secure from the cold, until the planting season.

In this genus is the famous poison-bulb, from which is extracted a deadly poison, mixed with the composition used by the natives of Southern Africa to cover the heads of their arrows. Mr. Burchell says*, " The plant is of frequent occurrence in the more arid districts of Southern Africa, growing both in sandy plains, and rocky spots, on the banks of the Bushmen's River at Rautenback's Drift. It is also found on the great sandy plains of Litaakun. I have been assured by the bushmen themselves, that the juice of the bulb is one of the ingredients most commonly used in the poisonous composition with which the heads of their arrows are covered. The wild antelopes seem carefully to avoid bruising the leaves of this plant, as I have observed it always left untouched, although the surrounding herbage has been grazed over."

CULTURE OF THE ANDROMEDA.

LINNÆUS, in his Tour into Lapland, states his reasons for applying to this plant the name of Andromeda (the fabled virgin). "*A. polifolia*," says he, "was now (June 12th) in its highest beauty, decorating the marshy grounds in a most agreeable manner. The flowers are quite blood-red before they expand, but when full grown, the corolla is of a flesh-colour. Scarcely any painter's art can so happily imitate the beauty of a fine female complexion, still less could any artificial colour upon the face itself bear a comparison with this lovely blossom.

" As I contemplated it, I could not help thinking of Andromeda as described by the poets; and the more I meditated upon their descriptions, the more applicable they seemed to the little plant before me, so that if these writers had had *it* in view, they could scarcely have contrived a more apposite fable.

" Andromeda is represented by them as a virgin of most exquisite beauty and unrivalled charms, but these charms remain in perfection only so long as she retains her virgin purity. The same is also applicable to the plant now preparing to celebrate its nuptials.

---

* Botanical Register, v. 7., fol. 567.

"This plant is always fixed in some little turfy hillock, in the midst of the swamps, as Andromeda herself was chained to a rock in the sea, which bathed her feet, as the fresh water does the roots of the plant. Dragons and venomous serpents surround her, as toads and other reptiles frequent the abode of her vegetable resembler, and when they pair in the spring, throw mud and water over its leaves and branches. As the distressed virgin cast down her blushing face through excessive affliction, so does the rosy-coloured flower hang its head, growing paler and paler till it withers away. At length comes PERSEUS in the shape of summer, dries up the surrounding water, and destroys the monsters, rendering the damsel a fruitful mother, who then carries her head (the capsule) erect."

The greater part of the species are hardy, and require to be grown more or less in damp shady situations.

They all thrive best in sandy peat, but where this cannot be obtained, a light loam, mixed with one half or more fine sand and vegetable earth, will suit them.

They are usually increased by layers, which merely require pegging in the ground, without any incision. This operation is best done in the autumn, and they will usually strike the following spring. The most suitable wood is that made the same year it is layered.

The *A. arborea*, and a few others, will produce seeds, which should be sown as soon as ripe in pots or in a frame, and be very thinly covered with soil, in consequence of the smallness of the seeds.

When about an inch high, plant them out thinly either in pots or on a bed, which must be covered, to prevent them from being dashed with wet.

When they are large enough, plant them in the open ground, which should always be done in spring, or the frosts and worms will throw them out in the winter.

The *A. Catesbæi*, *axillaris*, and *axillaris longifolia*, throw up abundance of suckers, by which they may be readily propagated.

A. tetragona, and *hypnoides*, should be sheltered during winter either in a pit, or frame, or under a hand-glass, and those standing in the borders should be sheltered with mats, to preserve them from the severity of the weather.

A. Japonica, *ovalifolia*, and *sinensis*, should be kept in pots, and preserved in the green-house during winter. They might be plunged in a shady border in May, and taken in again in October.

A. Jamaicensis, *fasciculata*, *buxifolia*, and *rubiginosa*, are stove plants, but may be set out of doors in summer, or plunged in a shady border, like the last. They are increased by cuttings taken off when young, and planted in sand under a bell glass.

HISTORY AND CULTURE OF THE TUBEROSE.

Perhaps no account of the history of this fragrant inhabitant of our stoves and green-houses is equal to that furnished to the London Horticultural Society, by R. A. Salisbury, Esq., and inserted in the First Volume of their Transactions, part of which excellent Essay we now give.

"The first account that I find of the tuberose, is in L'Ecluse's History of Plants, where it appears that, on the 1st of December, 1594, he received a specimen of it, in very bad condition, from Bernard Paludanus, a physician at Rome, to whom it was sent by the celebrated Simon De Tovar, of Seville. It certainly had not then been many years in Europe; and Linne, in his Hortus Cliffordianus, on this head, refers us to Plunner's 'Genera Plantarum,' who says it was first brought by Father Minuti, from the East Indies, into the senator Peiresc's garden at Boisgencier, near Toulon. It is much more probable, however, that it was introduced at an early period, and from America, for no author describes it as wild in the East Indies; Loureira only found it cultivated in the gardens of Cochin China; and Rumph says it was unknown in the Island of Amboyna, till the Dutch carried it there from Batavia, in 1674. On the contrary, Kamel informs us, that it was brought to the Island of Luzon, by the Spaniards, from Mexico; and Parkinson, in 1656, tells us, that the plants, which he describes as two species, 'both grow naturally in the West Indies, from thence been dispersed unto divers lovers of plants.' The senator Peiresc, as may be learnt from Gassendi, was only fourteen years old in 1594, when Simon De Tovar had already cultivated it at Seville; and, according to Redonte, it was not planted in his garden at Boisgencier, by Father Minuti, till 1652, whom that author makes to have brought it from Persia: I only infer, however, that he travelled from Hindostan over land. Redonte moreover asserts, that the authors of the Flora Peruviana found it wild in America; but in the work itself they say, cultivated in gardens. Hernandez's evidence, however, I think, takes away all doubt about the matter; he says, 'provenit in frigidis et temperatis regionibus, veteri incognita mundo;' and, as the *Agave*, to which the tuberose is more immediately allied, is also a native of Mexico, I am fully of opinion that it is indigenous there.

"The description given by the venerable L'Ecluse of his specimen, half dried and battered by the journey, with only the lowest flower of the spike expanded, affords a memorable instance of his accuracy and discernment. The size, the stem, insertion and figure of the leaves, and their hempy texture, are particularly noticed; the shape of the corolla, with its general similarity to that of the Asiatic hyacinths, but in consistence rather to that of the orange, is next remarked; and, having no knowledge of the root to guide this judgment, but what he derived from Simon De Tovar's appellation of *bulbus Indicus, florem album proferens, hyacinthi orientalis* *æmulum,* he guesses it may possibly belong to the same genus with the *bulbus eriophorus,* or Peruvian Hyacinth, though not without some doubts raised by its stem being covered with leaves, and its tubular corolla. Two years afterwards, these doubts were corroborated by his receiving roots, both from Simon De Tovar and the Comte d'Aremberg, which by August were full of leaves; and I think it worth noticing, that his figure of the plant appears evidently to have been made up from the original specimen sent by Bernard Paludanus, and one of these growing roots, which he expressly mentions did not flower: he concludes with observing, that if it is still to remain in the genus, it may be called *hyacinthus Indicus tuberosâ radice.*

"From this Latin phrase, no doubt, our silly appellation of tuberose, and the more accurate French name, *tubereuse,* originated; but in the East Indies it is distinguished by the poetical title of Sandal Malam, or Intriguer of the Night; in Spain, where, at the period of the plant's being discovered, it was the fashion to give both places and things religious names, it is called *Vara de S. Josef.*

"Soon after L'Ecluse's figure, an excellent one by Vallet, the embroiderer, came out at Paris in 1603, and both these were copied and published as different species, by Swertius, in his Florilegium. An original figure, which has great merit for that day, though not equal to Vallet's, next appeared in the Theatrum Flora, in 1622; it shows many roots flowering in one pot. From Ferrarius's pompous book, On the Culture of Flowers, we learn it was still regarded as a rarity in the Barberini gardens, at Rome, in 1633, but that it increased abundantly, and was taken out of the ground every year in March, to separate the offsets. Our countryman, Parkinson, more than half a century after its being first described by L'Ecluse, is the next author who treats of this plant; but valuable as many of his quaint observations still are to the horticulturist, his account of the tuberose does him little credit; he makes two species of it, saying, he thinks L'Ecluse never saw the first, though he owns 'some do doubt that they are not two plants severed, as of greater and lesser, but that the greatness is caused by the fertility of the soil;' his figures are wretchedly copied from Swertius, and by his calling it the Indian knobbed *Jacinth,* it appears not to have been known here then by its modern name. Gasper Bauhin, with his usual carelessness, also takes it up as two species from Swertius; and even the learned Ray seems to have known as little about it, in 1693, adding, however, to his second species, the title of tuberose.

"I meet with nothing more of any consequence respecting it, till Philip Miller, the pride of every British gardener, published the first edition of his Dictionary in 1731. He makes it a distinct genus from the *Hyacinthus,* and describes the variety with double flowers, now so common, but then only to be seen in M. De La Court's garden, near Leyden, whose memory is most justly consigned to infamy by our author, for destroying many hundreds of the roots, rather than parting with a single one to any other person; 'an instance of narrowness of mind and ill-nature,' he adds, 'too common among the lovers of gardening.'"—Salisbury, in *Horticultural Transactions,* Vol. I.

To cultivate it to perfection, observe—

1. Plant the tubers in twenty-four sized pots, filled with rich loam and rotted horse dung, about the beginning of March. In the first place separate any offsets; but be very careful the flowering bulb is not injured by doing so.

2. In potting lay about one third of broken potsherds at the bottom of each pot, to give a free and good drainage; and, having filled the pots with soil, either open a hole in the centre of each pot to admit the bulb, or gently press the bulb into the soil; in both let a little sand be placed under each bulb.

3. When the bulbs are potted, plunge them in a hot-bed or pine-pit, and keep them close shut up until they have begun to grow, when they may receive a little air.

4. Shift them in larger pots as often as they require it, until you have eventually placed them in twelves, in which size they should be allowed to flower. Be careful not to disturb the balls at each potting time.

5. As they advance in growth increase the proportion of air and water, to prevent their growing weakly. Allow them to remain in this situation until they begin to expand their flowers, when they may be removed to the green-house or conservatory.

CULTURE OF THE ARBUTUS, OR STRAWBERRY TREE.

Amongst the plants of this beautiful genus, one species, the *A. unedo*, is a native of Britain, being found on the rocks of Ireland. It is well adapted to plant in a conspicuous situation in the shrubbery, or to stand singly on a lawn, where, if the situation be warm, it makes a very pretty appearance when covered with ripe fruit. It will thrive in any common garden soil, but prefers a good portion of sandy peat.

The *Andrachne* also is pretty hardy, but will not easily bear our severe frosts whilst young. This should be kept four or five years under cover, in pots, before it is turned into the open border, and then it must be planted in sandy peat in a warm situation, where the soil is not liable to become very wet. It seldom or ever ripens its fruit in this country; but the fruit is said to be about the size of a raspberry, and to nearly resemble that of the *Unedo*. The only means we possess of propagating it, is by grafting on the common sort, and layers.

The *A. tomentosa, hybrida, Milleri, procera,* and *Menziesii*, will thrive in almost any situation, planted in sandy loam and peat, with the exception of *A. hybrida*, which should be planted in peat alone: this much resembles *Andrachne*, but is handsomer than either that or the *Unedo*, both in its foliage and flowers. It flowers early in the spring, and has a smell resembling honey. These are all readily increased by layers.

The *A. mucronata, Canariensis, serratifolia, laurifolia, densiflora, phillyreæfolia,* and *pumila*, require the shelter of the green-house or frame, and should be potted in sandy peat. They may be propagated by layers and cuttings.

CULTURE OF TREVIRANA COCCINEA.

1. When the plants have done blooming, be sparing in the supply of water, continuing to gradually lessen the quantity; so that in a month, or six weeks at most they may be kept perfectly dry.

2. The pots must then be placed in a dry and cool part of a green-house or back shed, where they will be quite free from frost, where they should remain until the following March.

3. In March cut off the tops, and turn out each pot of roots; and with a sharp knife carefully divide each ball of roots into four, or at most six parts, being careful not to shake off the soil or disorder the roots, in the operation; for that will prevent them for the most part from flowering so strong, and, in some cases, from flowering at all.

4. The soil most suitable is composed of light rich loam and leaf mould, equal parts, one fourth of peat, and a small portion of sharp sand.

5. The most proper sized pots are forty-eights, for the first potting; and the size must be increased every time they require potting, until they are finally placed in twenty-fours; in which they will flower.

6. Lay at least an inch of broken potsherds at the bottom of the pots, and plant the roots so that they will be covered about half an inch deep in the soil.

7. When potted place them in a hot-bed frame, which is not in a powerful heat.

8. When the plants have grown two inches high, remove them into a vinery or other convenient place, where they will receive more heat, and give them a regular supply of water.

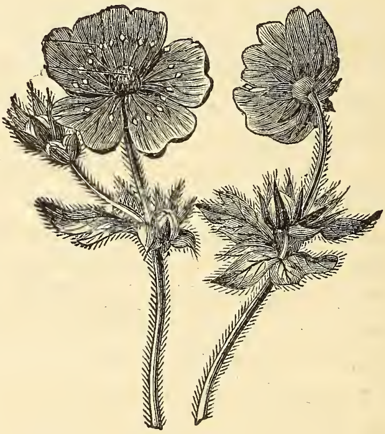
It is a custom with some gardeners, when the shoots have grown too inches high, to cut them off below the surface of the soil, with as much root as possible, and plant them in small pots.

Others again, in February or March, instead of dividing the roots, as we have recommended, with a knife, separate them from each other, and plant each singly in a small pot.

Either of these systems answers exceedingly well, providing they be gently forced afterwards.

CULTURE OF THE GENUS POTENTILLA.

All the species are very easily cultivated, and, with the exception of *atrosanguinea* and *Nepalensis,* (fig.) are perfectly hardy. Many of them are very suitable for rock work; and also grow and flower very beautifully in pots, filled with a mixture of sandy loam and peat, and are very easily propagated by division of the roots and by seeds.



The situation on the borders most suitable for them is where the soil is light and well drained, and where they will receive a good portion of sun. If the water stagnate, they will soon perish; and if they receive little or no sun, none except those bearing yellow flowers will attain to their true colours.

If grown in pots, good drainage is necessary; the compost must be turfy loam and peat well chopped together, but not sifted; for, if sifted, it is apt to become too solid and close, and thereby prevent the roots from striking so freely.

The best time for potting is immediately after the flowering season, and early in the spring, at least two months before the flowering season commences.

To propagate by the division of the roots, the best times are immediately after the plants have flowered, or in April following; at either time with proper treatment they will make fine plants quickly.

Sow the seed as soon as it can be cleared from the pulp of the fruit, in pans or the open ground; and, as soon as the plants are large enough, transplant them into small pots, and treat them like old plants.

The two tender species may be treated in the same way as half hardy plants; that is, first sow in pans, and then transplant them into single pots, until it is time to turn them out into the open borders.

TO CULTIVATE STOVE FERNS.

The following is a pretty successful method of raising Stove Ferns from seed:—Fill any convenient sized pot with sandy peat earth, and on the top allow a few pieces to rise above the rest.

When this is done, merely shake the seeds on the top and sides of these pieces. It will be readily understood that the minuteness of the seeds require this precaution, for by sowing them in a pot on a level surface, the whole of the seed would be subjected to the same kind of treatment, which might happen to be either too wet or too dry; indeed, it is not impossible, even with the greatest care, that they may be occasionally both.

The soil in which the seed is sown ought to be scalded with boiling water, in order to kill any seeds of the common hardy kinds that may accidentally have found their way into the soil, such as *Aspidium filix-mass*, and some others, which will, even with this precaution, not unfrequently intrude themselves.

They seldom succeed so well in a close frame as in a cool part of the stove, where evaporation can be most effectually prevented, and will by no means endure to be continually kept close under bell glasses.

Water must never be applied to the surface of the pots, but by keeping the pots in feeders which contain a little water, they will generally be found to keep themselves sufficiently moist.

These few excellent observations were kindly furnished to us some time ago by Mr. Marnock, formerly gardener at Bretton Hall, but now curator of the Botanical and Horticultural Gardens in progress at Sheffield. We have practised it, to our most perfect satisfaction, in our stove at Chatsworth.

OPERATIONS IN THE FLOWER GARDEN FOR AUGUST.

AZALEAS may yet be propagated by cuttings of the young wood, taken off close to the plants, and planted in sand under a hand-glass in a shady situation, page 127, rules 8 and 9.

CAMELLIAS wanted to flower early, may be brought into the green-house; the remainder may stand out of doors till the end of September, or beginning of October, page 33.

CARNATIONS may be layered or raised from cuttings taken off at the third joint, and planted under a hand-glass. Transplant seedlings six inches apart, in light rich earth, page 69.

CALCEOLARIAS, intended to flower late in the autumn, should now have the branches cut down to within an inch of the soil, and be top-dressed. Cuttings may also still be put in with success.

CHIMONANTHUS FRAGRANS may now be increased by layers; cuttings of the young wood will also grow if planted in sand under a bell-glass, and the pot be plunged in a little heat.

CYCLAMEN PERSICUM should be turned out of the pots in which they flowered, and planted in an open but sheltered border.

DAHLIA CUTTINGS may yet be put in with success, page 105, rule 17. The old plants will also require staking, page 106, rule 27.

GREEN-HOUSE PLANTS of most sorts may still be propagated by cuttings.

MIGNONETTE, to stand the winter in pots, should be sown about the middle of the month in light, sandy, maiden soil, perfectly free from dung.

ORANGE AND LEMON STOCKS may be budded if not previously done; and cuttings may also be put in, page 91, rules 6—10.

PINKS may yet be propagated by pipings planted under a hand-glass, if a sufficient quantity be not put in, page 67.

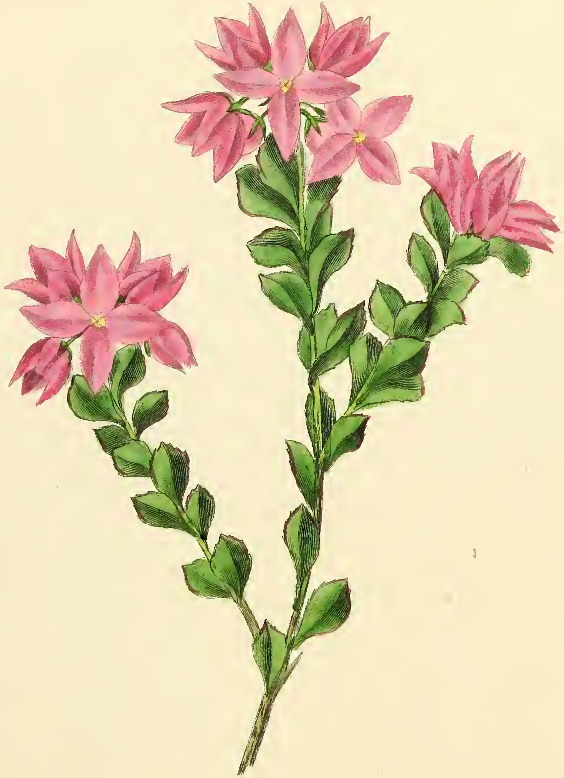
RANUNCULUSES should be taken up, if not previously done, and spread in a dry, airy, situation to prepare them for laying by, page 42. Those planted last month will flower about the middle of September. Also plant some now in pots to flower in midwinter in the green-house.

ROSE TREES of most sorts may still be budded; but the China varieties do the best if budded early in the season, page 142, rules 27—38.

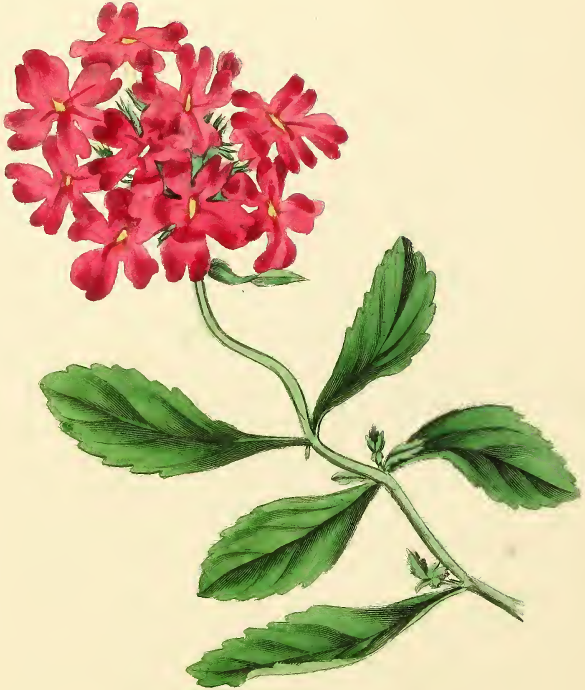
ROCKETS when out of flower, cut down the stems nearly to the ground to induce shoots to grow for cuttings.

TIGRIDIA PAVONIA.—Seedlings which were transplanted on a hot-bed, and fully exposed to the air last month, will begin to die down; when this is the case, take up the roots, and lay them in an airy situation to dry. When dry put them in paper bags, and lay them out of the reach of frost during winter, page 85.

VIOLETS may still be propagated by dividing the roots, and cuttings, page 115.



Boronia Serrulata



Verbena melendris

SEP .934

BORONIA SERRULATA.

(SAW-LEAVED BORONIA.)

CLASS. OCTANDRIA.

ORDER. MONOGYNIA.

NATURAL ORDER. RUTACEÆ.

GENERIC CHARACTER.—*Calyx* four cleft, permanent. *Petals* four, ovate. *Nectarium* coronate. *Filaments* incurved. *Capsules* four, bivalve. *Seeds* solitary, ovate, and compressed.

SPECIFIC CHARACTER.—A leafy bush. *Leaves* opposite, imbricated, serrated. *Flowers* rich rose colour, terminal, forming small heads, each containing four or five flowers. *Calyx* four-leaved. *Petals* four.

This plant, which is one of the most showy of the genus, was raised from seed by Mr. Colville. It is a native of Port Jackson, whence it was introduced in 1816.

It should be potted in sandy peat; the pots should be well drained with potsherds; it thrives best in a cool airy greenhouse, and should be placed in a situation where the sun will not shine too powerfully upon it. If the roots be allowed to become matted round the sides of the pots, and the plants be placed in the sun, they will invariably become sickly, and die. They may be struck from cuttings of the half-ripened wood obtained about May, taking care to allow them to dry occasionally, or they are liable to damp off. They may also be raised by layers, without making any incision.

VERBENA MELINDRES.

(SCARLET VERVAIN.)

CLASS. DIDYNAMIA.

ORDER. ANGIOSPERMIA.

NATURAL ORDER. VERBENACEÆ.

GENERIC CHARACTER.—*Calyx* quinquefid. *Corolla* five-lobed, and unequal. *Stamina* inclosed within the tube. *Stigma* blunt. *Seeds* two to four.

SPECIFIC CHARACTER.—*Plant* perennial, branches spreading and hairy. *Leaves* opposite, deeply toothed, rough to the touch on the upper side, and hairy on the under side. *Flower-stalk* from six to nine inches long.—*Flowers* dazzling scarlet, forming a corymb.—*Calyx* hairy, tubular, half the length of the corolla. *Corolla* with a yellowish white tube, limb spreading, scarlet, three lower segments larger than the two upper ones.

SYNONYMS.—V. chamædrifolia, Curtis, Bot. Mag. t. 3333; V. veronicifolia, Sm. in Rees' Cyclop.; Crinis Peruvianus, Linn. Sp. Pl.

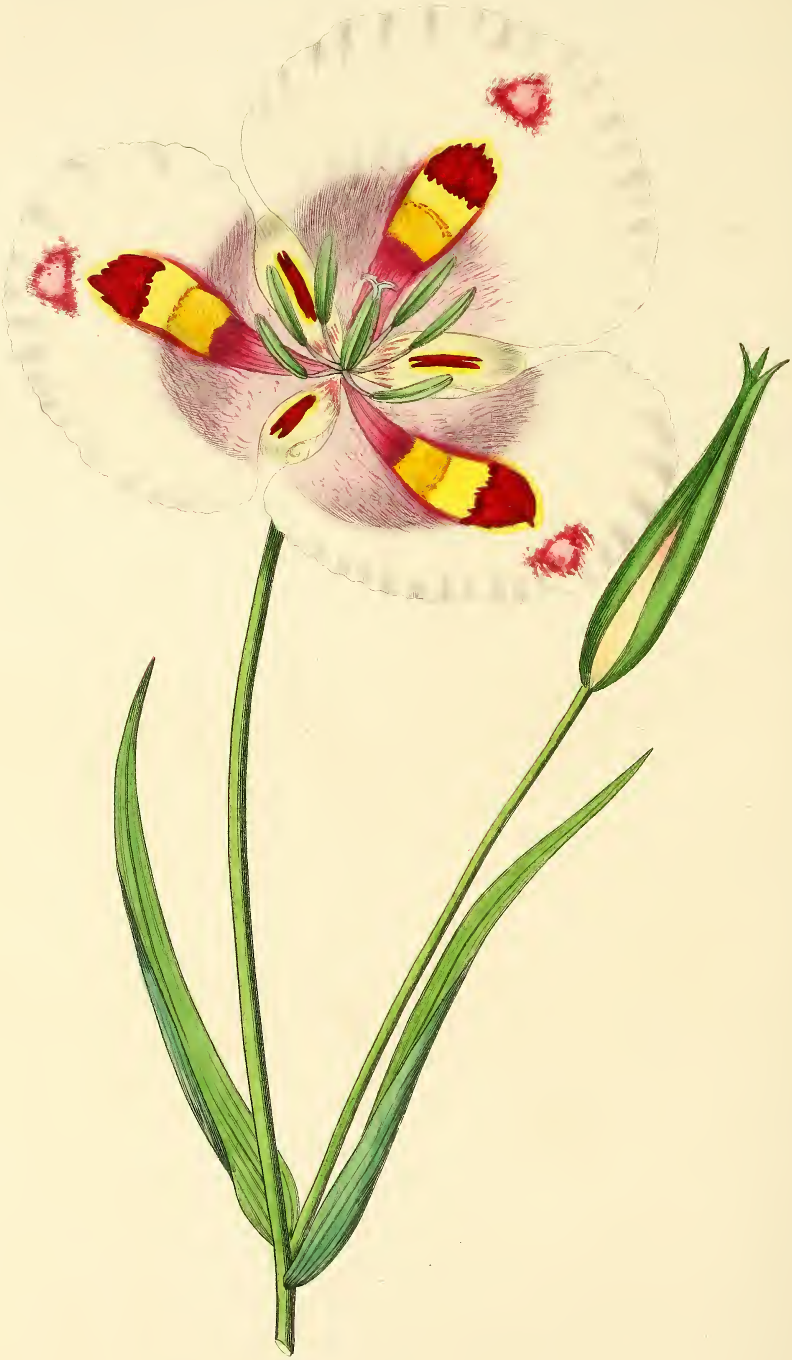
This plant is a native of the plains of Buenos Ayres, where it is stated to be very common; it was discovered by M. Poussette, and communicated by him, in 1826, to J. Hawkins, Esq., Bignor Park, where it flowered for the first time in this country, in May 1827.

Though this elegant plant has been cultivated in this country ever since that time, it is still complained of as being with difficulty kept through the winter. We are, therefore, induced to state our manner of management, which is attended with complete success.

In spring, as soon as the plants have grown two or three inches, we take off the cuttings, always leaving the lower eye of young wood upon the plant to push again; these cuttings, if planted in pots of light soil, not too thick, will be rooted in eight or ten days; they are then potted off into sixty-sized pots, and, when the weather permits, planted where they are to flower in the summer and autumn.

The plants intended for the next season's stock are allowed to remain in the small pots until the beginning of August, and are then potted into forty-eight-sized pots; by this means they become strong-established plants before winter, and, if kept on an airy shelf in the greenhouse, in a dry cold frame, or any place where they will receive abundance of air, and be protected from severe frosts, this gem of the gardens will thrive and flower luxuriantly.

The generic name is said to be derived from *ferfaen*, the Celtic name of the vervain. Melindres, according to Dr. Lindley, is the "vernacular" appellation of this species in the province of Buenos Ayres.



Calochortus venustus

E 1834

CALOCHORTUS VENUSTUS.

(BEAUTIFUL CALOCHORTUS.)

CLASS.
HEXANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
LILIACEÆ.

Generic Character.—*Plant* bulbous. *Leaves* acuminate. *Calyx* three-leaved, narrow, and acuminate. *Petals* three, large, broad, and coloured. *Ovarium* triangular, three-celled, and many-seeded.

Specific Character.—*Stems* from a foot and a half to two feet high, having from three to five stiff, narrow, green leaves, which roll up at the edges, and are very sharp pointed. *Flowers* very handsome, continue open for several days. *Calyx* pale green, with a bright red blotch betwixt the petals. *Petals* pure white at the upper part, and somewhat yellowish towards the base which is hairy, and where the three petals form something of a cup. Towards the base of each petal is a deep crimson stain, somewhat in the form of a wedge, terminated by bright yellow, above which is another deep stain bordered with yellow, and a little nearer the end of the petal is another red spot having within it a tinge of blue.

This beautiful plant was sent by Mr. Douglas, from California, to the Horticultural Society, in the last part of whose transactions it is figured. See Vol. I., New Series, p. 412.

It appears to be nearly, if not altogether, hardy, but we have hitherto only grown it in a pot, which stood in a very airy situation in the greenhouse. In this place it flowered beautifully in June last, when our drawing was taken. The bulbs will probably require taking up when the leaves are withered.

The best sort of soil for it appears to be a sandy peat soil, mixed with a small portion of loam.

It appears to produce plenty of seeds, by which, and offsets, it may be propagated.

We do not doubt but it will do very well planted out in the open border, provided the bulbs be always taken up when the leaves are dead, which happens in September. As they will commence growing again before the winter is over, it will be advisable to plant them in pots, and keep them in the greenhouse until the weather is sufficiently fine to turn them out into the borders again.

TROPÆOLUM MAJUS ATROSANGUINEUM.

(DARK RED INDIAN CRESS.)

CLASS. OCTANDRIA.

ORDER. MONOGYNIA.

NATURAL ORDER. TROPÆOLEÆ.

Generic Character.—*Calyx* five cleft and spurred. *Petals* five, unequal. *Germen* three sided.

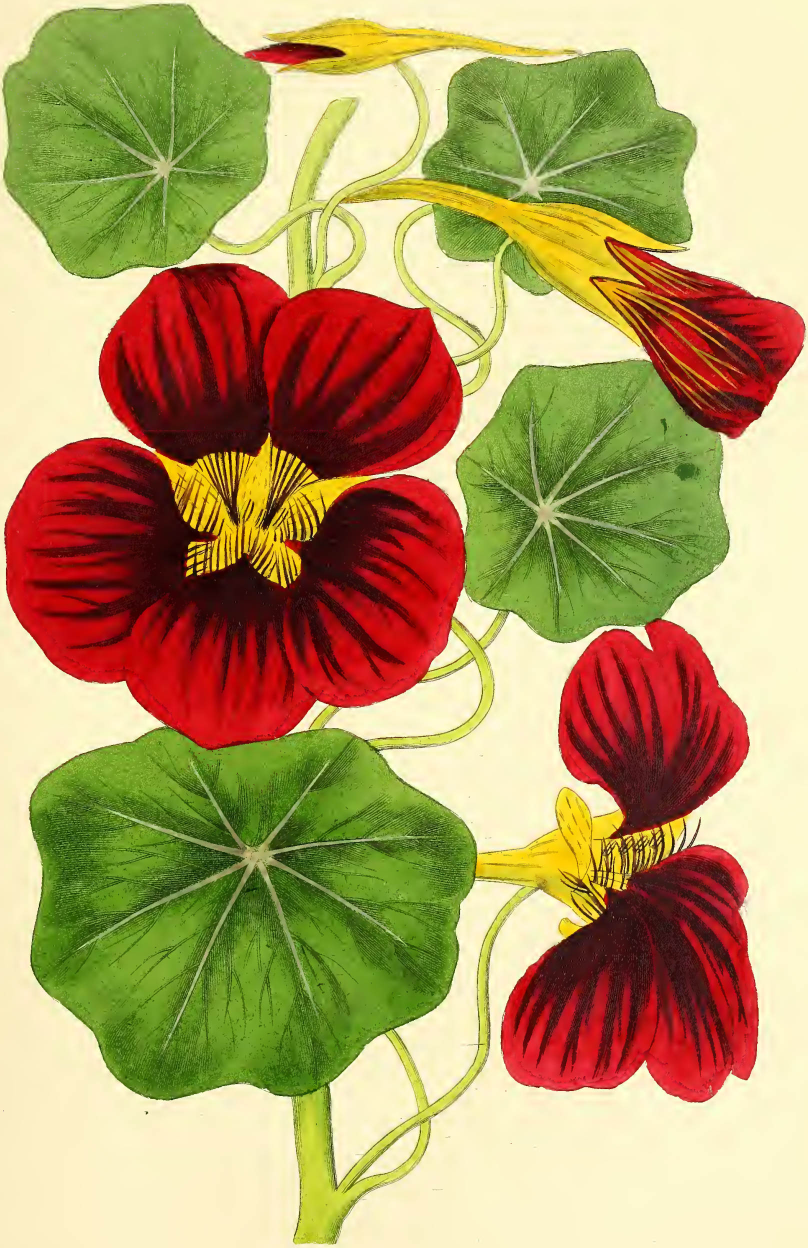
Specific Character.—Annual. *Stem* round, smooth, branching, two feet high, covered with small red spots. *Leaves* on long irregular footstalks, round, with from five to seven broad even angles, slightly covered with hairs on the upper side, and more thickly on the under. *Flowers* large, dark velvety red. *Calyx* bright orange, with five or six longitudinal stripes of red extending nearly the length of the spur. *Petals* five, nearly equal in size, three lower ones with long incurved claws attached to the broad part, the base of which is fringed with a number of small segments terminating in fine bristles, the base of the two upper somewhat orange, striped with seven longitudinal lines.

Synonyms.—Cardaminam ampliori folio et majori flore —*Tournef.* Acriviola maxima odorata.—*Boerh.*

The *Tropæolum majus,* of which the present plant is a variety, is a native of Peru, and is stated to have been introduced as early as 1684. Elizabeth Christine, one of the daughters of Linnæus, is said to have perceived the flowers emit sparks like those of electricity, visible only in the evening, but this we have never yet observed.

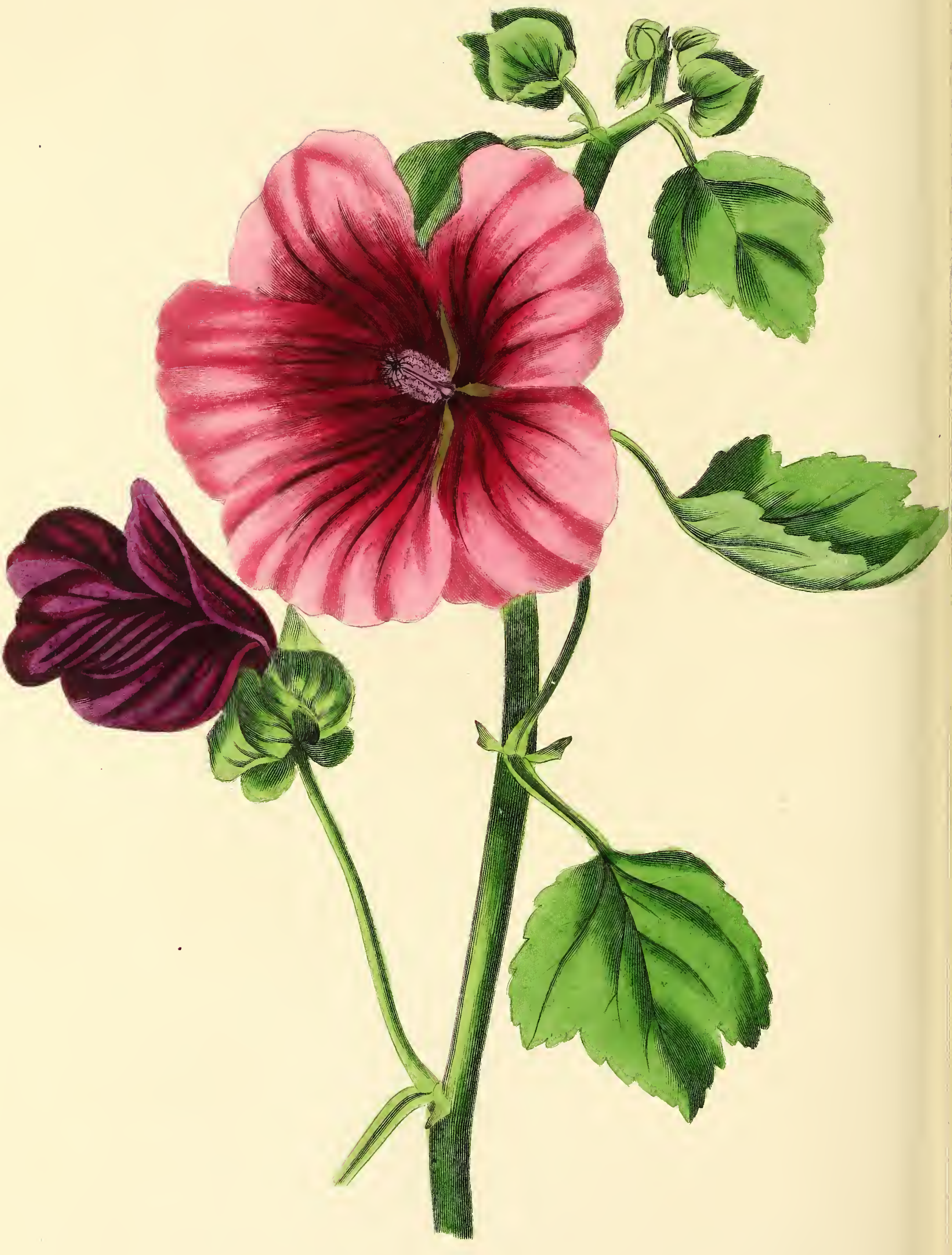
All the species are easy of culture, and very strong, particularly the present variety. It does not grow so rampant as the common kind, but is much handsomer, and will, like it, grow in any light rich soil.

It is very readily increased by seeds and cuttings of the stem, cut off at a joint, and planted in pots of light soil, and placed in a slight heat, without glasses, or if not placed in heat they will grow when planted under a handglass, on a shady border.



Tropæolum Majus atrosanguineum.

Sep.1.1834.



Malopa grandiflora.

MALOPE TRIFIDA GRANDIFLORA.

(GREAT-FLOWERED TRIFID-LEAVED MALOPE.)

CLASS.	ORDER.
MONADELPHIA.	POLYANDRIA.

NATURAL ORDER.
MALVACEÆ.

Generic Character.—*Calyx* five-cleft, surrounded by a three-leaved involucrum, the leaflets of which are heart-shaped. *Capsules* many, collected in a head without order, one-seeded.

Specific Character.—*Plant* bears a great resemblance to the common *trifida.* *Stem* round, smooth, grows one to two feet high. *Leaves* from three to five nerved, toothed, slightly sprinkled with a few hairs round the edges whilst young, but smooth as they advance in growth, lobes acuminate. *Flower-stalks* axillary. *Flowers* solitary, brilliant purple rose colour, about three inches diameter, when expanded. *Calyx* segments of the inner ovate-acuminate, thinly covered with bristle-like hairs, leaflets of the outer heart-shaped, also covered with hairs round the edges. *Petals* five, equal, adhering to the tube of the stamens at the base. *Stamens* numerous, indefinite; filaments collected into a column.

This new and beautiful annual we believe to be a variety of *M. trifida.* We are unacquainted with its history; and therefore cannot say by whom it was raised.

The *M. trifida* is a native of Spain, Portugal, and Mauritania, and was introduced to this country in 1808.

The flowers of the present subject are far more showy than the trifida, and the plant well deserves extensive cultivation.

It is readily increased by seeds, which merely require sowing in the open border, about the beginning, and until the middle of April.

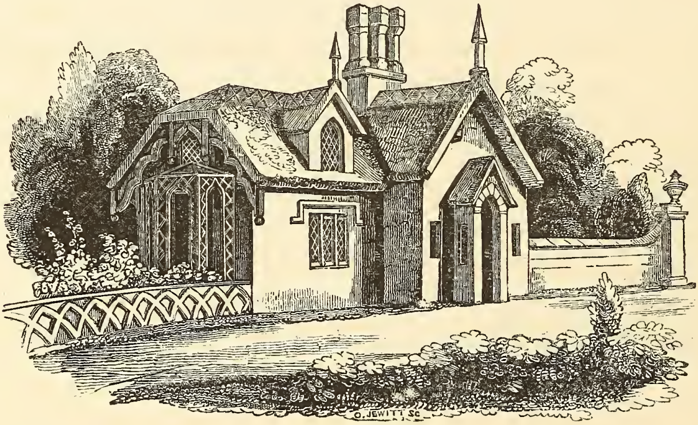
It will flower considerably sooner, if the seed be sown in pots and transplanted, and afterwards turned out into the borders after the manner of half-hardy annuals.

The generic name is derived from *Malos,* tender, alluding to the softness of the leaves.

PLAN AND DESCRIPTION OF A GATE LODGE TO A COUNTRY RESIDENCE.

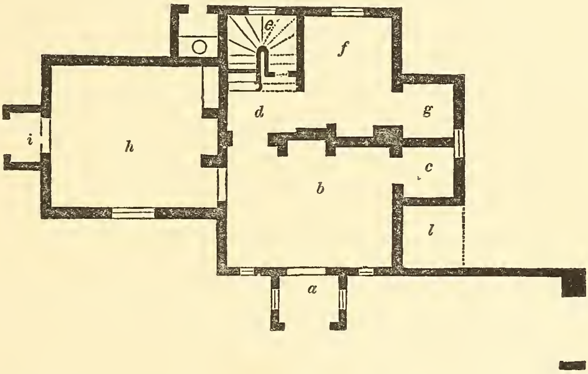
The situation of the entrance-gate and lodge to a country residence must depend chiefly upon the locality of the place, but frequently upon the judgment of the landscape gardener in adopting the proper situation with reference to the park, and for the approach-road. The picturesque appearance, however, of the lodge, must depend on the artist's skill as an architect. The eye of taste is frequently offended by the shapeless, cold, and uninviting appearance of the gate lodge, which bespeaks poverty and a want of enterprise in the owner; and we are ready to turn away from it under the impression that, if we approach, our welcome will be but cold and heartless; while, on the other hand, the neat, light, picturesque lodge invites the visiter to enter the abode of cheerfulness and plenty. But the architect, or landscape gardener, with superior taste, unless balanced by an equal degree of judgment, is as liable to err in erecting a fine lodge as an unseemly one.

Fig. 1.



It is the mansion that must determine the magnitude, the style, and character of the lodge; for when we enter by a fine architectural gateway, approach the road by many windings and turnings, and the plain, unrelieved, white-washed, cubical-shaped mansion bursts upon our view, we feel the sensation of disappointment as keenly as in any case of anticipated pleasure denied us. The gate lodge may be applied in different ways: either by being united with the gate, and having a lodge on each side, with footways, and forming one architectural whole by a single lodge joined to the gateway, or by a detached lodge. In the later case, the gate itself should be of course a subordinate object. The double lodge gateway would be best applied to palaces and large mansions; and the single lodge gateway, and the detached lodge and gate would suit small mansions and villas. The accompanying sketch of a detached lodge (fig 1), after the old English manner, would be suitable for a small villa in the Elizabethan, or any other old English style. The ground plan (fig. 2) has an entrance-porch (*a*) ; gate-keeper's sitting-room (*b*) ; closet for tools, &c. (*c*) ; lobby and staircase (*d*) ; closet under the stairs (*e*) ; back-kitchen for cooking and washing (*f*) ; pantry (*g*); parlour, with a cupboard beside fire-place (*h*) ; trellis work porch communicating with the garden (*i*); water-closet (*k*); and open shed for wood, &c. (*l*).

Fig. 2.



In the chamber floor, there is a bed-room for the man and his wife ; and two smaller bed-rooms for male and female children.

The walls of this building may be of brick-work, rough-cast externally ; and the roof covered with reeds in the usual manner ; or, perhaps, slates or painted tiles would be preferable, though not so characteristic, as being less liable to accident by fire. The barge boards and pendants should be of oak, or at least wood-work painted to imitate that material. The windows to have wooden mullions as shewn by the elevation, painted of an oak colour, and the exterior doors to have the old English character, which may be done by nailing square pieces of wood diagonally on the outer surface, to imitate the heads of large nails. This lodge, if neatly finished internally, would make a comfortable little habitation ; and if erected in the manner above described, about twenty miles from London, where labour is cheap, the expense would be about 186*l*. There should be of course a little garden behind the lodge, to supply the occupants with vegetables ; and the border immediately round the house might be tastefully laid out with flowers, both for the sake of neatness, and the pleasure and instruction it would afford to the gate-keeper and his family. The above was furnished us by one of our correspondents to the Horticultural Register, and inserted in that work, vol. ii., p. 404.

CULTURE OF THE GENUS CYCLAMEN.

The whole of this genus, with the exception of *C. Persicum* and its varieties, are hardy, or nearly so, and grow freely in light rich soil. They produce abundance of seeds, by which they are very easily propagated. All the species are beautiful, and well deserving cultivation; some are delightfully fragrant, as *C. Europeum,* and *C. Persica odorata.* The *C. Coum, Persicum, vernum,* and *hederifolium,* with judicious management, may be made to produce flowers throughout the year.

To cultivate the *C. Persicum* and its varieties to perfection, observe the following rules:—

1. When they have ceased blooming, which will be about the end of April, take the roots out of the pots, and keep them dry. This is preferable to allowing them to remain in the pots of dry soil; for sometimes it happens, from the situation in which the pots containing the roots are placed, that the roots start prematurely to grow, particularly if the situation be too damp or too warm. This invariably weakens the plant, and prevents it flowering so fine.

2. In the first or second week in September, plant them again. This may be either done in forty-eight-sized pots, or out in the open borders; if the latter be the system followed, they must be taken up and re-potted when the leaves are well formed, and the pots set for a while in a situation where they will receive a little heat; but when they have established themselves, and begin to show flower, remove them to an airy part of the greenhouse, and conservatory, to flower. If the roots be planted at first in pots, place them in a cold place, or out of doors, until they have begun to form their leaves, when they may be placed in a warm greenhouse or frame, until they show flower, when they should be removed to a cool airy situation.

3. From first to last they require abundance of air, particularly through November and December. If this be not attended to, little success may be expected

4. Judicious watering is very essential in the cultivation of *cyclamens.* When they begin to grow they must have a regular supply; but, during November and December, it must be nearly wholly suspended, giving only just as much as the plant will exist on, and that must be carefully preserved from falling upon the leaves, or they will damp off. In February, however, as the flowers advance, and evaporation increases, they may receive more, and when in full flower a good supply is required. When the flowers fade, the quantity of water must be again diminished, until the roots are ripe, when they may be taken up, as recommended above.

5. The best soil to plant them in is a mixture of equal parts of loam, leaf mould, and rotten dung, with a small portion of peat.

6. Always give a good drainage with broken potsherds, and never plant the roots too deep, for, if they imbibe too much moisture, they are nearly sure to perish.

7. Select the finest flowers for producing seed, and place the plants intended for the purpose in a particularly airy situation, and it will soon ripen.

8. When ripe, sow it immediately in pans or pots, and place them in the greenhouse, where they may be allowed to remain till the end of April, when they will have formed roots nearly as large as a pea.

9. At the end of April, take up the roots and plant them in a bed of light soil, composed of loam, leaf-mould, and rotten dung, with a small portion of sandy peat, as recommended for the old roots. The roots should be planted about four inches apart, and about an inch deep; set a hand-glass or frame over them, to protect them from excessive wet and cold; but in fine weather expose them to as much air as possible.

10. In June, or when the weather is quite settled, remove the lights or glasses altogether, and no more care is required until the end of September, except giving a little water as often as they require it.

11. About the end of September or beginning of October, the roots should be carefully taken up, and planted in sixty-sized pots, in the same manner as recommended for old roots.

All the other species may be brought forward and made to flower finely in the greenhouse: the *C. repandum*, indeed, does by far the best in the greenhouse regularly, but should always be placed on a shelf in a very airy situation.

CULTURE OF THE PRIMULA PRÆNITENS.

(SINENSIS, LINDLEY.)

" THIS plant is a native of China, and was introduced into this country in the year 1820; and from its free blooming habits, and gay appearance in the winter months, when under good cultivation, is well deserving of the notice of every lover of plants *." The method of culture is as follows :—

1. Make cuttings of all the old plants, taking them off a little above the surface of the soil, and with a sharp knife cut off the bottom leaves, but by no means disturb the upper ones.

2. Fill a quantity of various sized pots with rich mould, composed of equal parts of loam, peat, and rotten dung: select the pots according to the strength of the cuttings.

3. Previous to filling each pot, lay a good portion of broken pot, to give a good drainage, or the plants will be liable to perish.

4. Plant one cutting in each pot, and put a little white sand round it; and give to each a sprinkling of water through a fine rose watering-pot.

---

* Horticult. Reg. vol. ii. p. 164.

5. When planted, remove them to a close frame, and plunge them in a little bottom heat, admitting no air till they begin to grow.

6. As soon as they show flowers remove them to the greenhouse, when, if they be judiciously watered and receive plenty of air, they will grow to great perfection most of the winter.

7. When they have done flowering, the old roots may, if convenient, be placed in a gentle bottom heat, to push forward a good supply of cuttings; but, if not convenient, the old roots will produce cuttings without this heat. They also produce abundance of seeds, by which they are easily raised.

8. Sow the seed, as soon as it is ripe, in pans or pots, filled with light sandy soil and leaf mould, equal parts, unsifted; raise up the soil in the centre of the pan, as recommended for Auriculas, page 10, rule 9, and cover the seeds not deeper than the eighth of an inch with the same soil, finely sifted or rubbed in the hands.

9. Water them very carefully until they begin to vegetate; indeed we would recommend to cover the soil with a little damp moss to prevent the soil becoming dry. This is advisable for most small seeds sown in pans, for if the soil dries rapidly the necessary supply of water to keep it in a state suitable to assist vegetation sometimes destroys the seeds altogether.

10. As soon as the plants appear, clear away the moss, but slightly shade the plants for a day or two, because, being very small, and never before fully exposed to the light they will materially suffer by immediate exposure to the sun or air. Water with a rose as often as they require it.

11. When they have formed three rough leaves, transplant them into sixty-sized pots, filled with equal parts of light loam, sandy peat, and very rotten dung; draining well, as recommended for cuttings. After the plants become large enough the sooner this is done the better; for if they be allowed to stand long in the seed-pot, they very often perish.

12. Repot them as often as they require it, until they are finally replaced in thirty-two sized pots, in which they will flower.

They are very easy of culture, and flower without difficulty, provided they be well drained, and not overwatered.

ON A NEW METHOD OF WRITING ON PLATES OF ZINC FOR LABELLING PLANTS.

M. Henry Braconnot, the celebrated French chemist, of Nancy, to whom we are indebted for the curious transformation of rags and other similar vegetable substances into starch, gum, and sugar, by the agency of oil of vitriol, and whose name is well known in the chemical world for various researches connected with the analysis of vegetable substances, has given, in the last number of the *Annales de Chimie et de Physique,* a preparation for writing on plates of zinc to label plants. The writer having a dislike to painting in oil, which is often inconvenient, and never endures a long time, resolved to turn his attention to some other way which would prove both ready and durable. The system of writing on zinc with a black crayon, which was accidentally discovered by M. Symon, an amateur at Brussels, and noticed in the *Revue Horticole* for October, 1832, and the *Bon Jardinier* for 1833, possessing many imperfections, led M. Braconnot to try some experiments, being anxious to obtain a liquid, or a species of ink which would be perfectly durable when exposed to the changeableness of the weather, and also one with which he could write with ease. This end, after several proofs, he is induced to believe he has in a great measure attained.

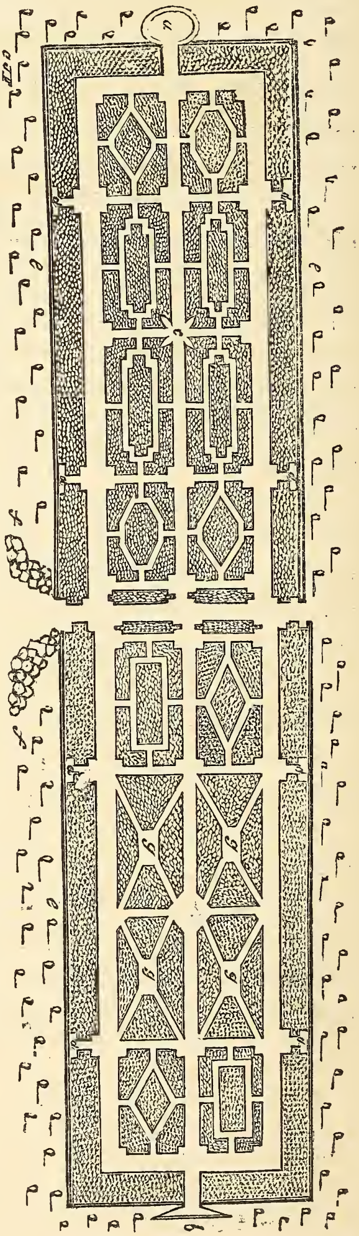
If it answers, he will have done both the botanists and amateurs a real service. The preparation is as follows:—

Take verdigris in powder, one part; sal-ammoniac in powder, one part; lamp black (noir de fumée), half a part; water, ten parts.

Mix these in a glass or pot mortar, at first only adding as much water as will mix it well, then add the remainder of the water; when placed in a vessel, let it be well shaken up from time to time, and in a few days it will be ready for use. This is not only excellent for labelling plants, but also for marking objects it is wished to preserve in low, wet situations, and for marking keys, becoming quickly dry, and being very durable.—*Ann. de Chim. et de Phys.*

PLAN OF A FLOWER GARDEN,

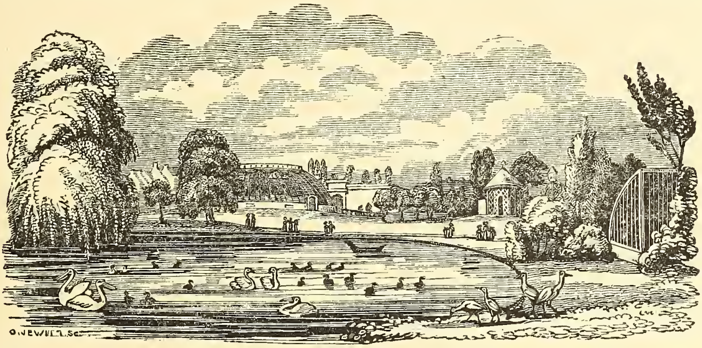
WITH A REMARK OR TWO ON THE SURREY ZOOLOGICAL GARDEN.



The annexed is a plan of a piece of ground laid out for flowers, by Mr. Smith, gardener, at Snelston Hall, Derbyshire. It would agree with any modern building, but there is something of antiquity about it which corresponds better with a gothic structure, and when well enriched with flowers and other curiosities, it renders the parterre exceedingly pleasant to the sight; the one here shown has gravel walks, and box edgings, and would answer well if the beds were planted in masses, but it is stocked chiefly with about six hundred species of herbaceous plants.

By this mixture of planting, without further trouble, there is a successional show of flowers the whole year, and, in addition, the vacancies are sown in the spring with some of the best annuals, chiefly of a minor character; the taller ones being more applicable to the decoration of the shrubbery walks, &c. The herbaceous plants are chiefly hardy; yet they require some degree of shelter from north winds, and protection from the mischief of hares and rabbits. Any light wire fence or trellising answers for protection, and likewise for the support of climbing plants. On the outer side the guard, a second fence or screen would be useful and highly ornamental, if composed of evergreen shrubs, and planted alternately with Rhododendrons, Cypress, Magnolias, &c. &c.

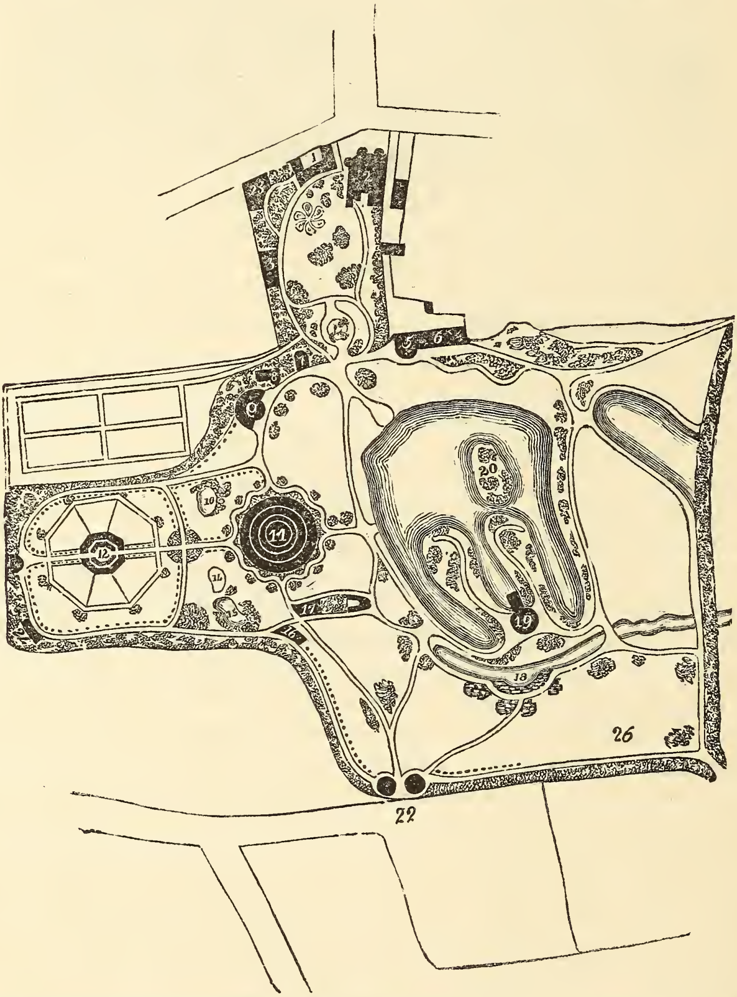
(*a*) Verandah.	(*e*) Gothic trellis.
(*b*) Gothic seat.	(*f*) Rock work.
(*c*) Water vases, different patterns.	(*g*) Statues.
(*d*) Gothic chairs.	



In point of Landscape Gardening, the Surrey Zoological Garden possesses some beautiful and extensive views. If a person stands in the situation marked (26) on the ground plan; the sight is grand and imposing, perhaps not to be equalled in any garden, either public or private, for many miles round London. The whole was conducted under the excellent judgment of Mr. Henry Phillips, who, to say the least, has in this one instance, setting aside every other, shown a taste that does him the greatest credit as a landscape gardener. One great object of Mr. Phillips was to give a bolder style than is seen at the Regent Park Gardens.

The enterprising spirit and indefatigable labours of Mr. Cross deserve the highest praise: he has had a beautiful lodge entrance (1) erected, opening into Venton Place, close to Manor House (2); to the right of the entrance are rooms appropriated to birds on sale (23), and a short distance from them a neat inclosure for pheasants (3). A number of curious water-fowls occupy a basin on the grass (4). The monkeys also enjoy a species of perpetual summer, and show their little tricks to advantage in all weathers, in a glass conservatory (5); attached to this monkey conservatory is a commodious eagle-house (6); there are also two more enclosures for pheasants (7, 13); (8) is gentlemen's closets; (9) confectionary and cloak-room; (10) is a small pond for alligators, and then the visiter comes to one of the most imposing structures of the age—the glass conservatory for tropical animals, birds, and plants (11); this capacious building is near three hundred feet in circumference, and is most judiciously arranged. The animals occupy a series of cages or compartments, forming a circle in the centre of the building; exterior to these is a colonnade which supports the roofs, here are numerous cages of interesting birds, hung and otherwise fixed; there is then an open area for the spectators to parade in, which is bordered with a stream of water for exotic fishes. This novel edifice has entirely originated with Mr. Phillips, and at once proves his ability and ingenuity.

The ruins for eagles (18) which perhaps has been rarely surpassed, even where expense has been no object, was merely built out of such rubbish as came in the way, for it must be understood, the question with Mr. Phillips was not how *well* but how *cheap* he could transform this marsh into a pleasure ground. The octagonal building (12), surrounded by paddocks, is filled with many rare specimens of foreign domestic animals; the seal occupies a small pond (14), not far from the large conservatory, near to which is the elephant pound (15), and elephant house (16); there is also a cave for the tortoise, and a partition for the armadillos (17). The hermitage and boat-house (19) stand on the edge of one of the most interesting lakes in the vicinity of London. In this water is an island for monkeys (20); the site for the bear-pit is marked (21); from Kennington is an entrance-lodge (22), near to which is a park enclosed for deer on sale; (24) is the camel-house. Where there are dotted lines, forest trees are planted, each of which is labelled with its Latin and English name, together with the country of which it is a native, and a more interesting walk as an Arboretum, perhaps, has not previously been formed. The garden contains fifteen acres, about three of which are covered with water.



Although the above description of the Surrey Zoological Gardens is not much connected with the culture of plants, yet the distance is not so great as at first sight may appear, for the taste displayed in laying out a piece of ground, whether that ground is to be occupied by either plants or animals, in so far as the most beautiful views and best effects are to be produced in either cases as the nature and disposition of the ground and other circumstances will allow. But we are unable, for want of room, to enlarge at this time, but we shall resume the subject again shortly.

HISTORY AND CULTURE OF THE CHINESE CHRYSANTHEMUM.

LINNÆUS, in 1753, first published this plant as a species, with two of its varieties, under the name of *Chrysanthemum Indicum,* in his first edition of the " Species Plantarum;" the same plant, under the name of *Matricaria,* having been given by Kœmpfer, in 1712, in his account of the plants of Japan, where it is cultivated by the natives in their gardens; and he describes eight double varieties of the genus, of various colours. It is also mentioned by Breynius, Plukenet, Rhæde, and Petiver. Thunberg mentions in his *Flora Japonica,* published in 1784, that it grows spontaneously near Nagasaki and other places in Japan; and Loureiro, in his *Flora of Cochin-China,* mentions it as one of the plants of that country. Rumphius, in his very elaborate work on the " Plants of Amboyna," published in 1750, is more particular in his information respecting this plant than any preceding author. The Chinese, by whom it is held in high estimation, pay much attention to its culture: they keep it in pots and jars, placing it before the windows of their apartments, and decorate their tables with it at their entertainments; on which occasions he that produces the largest flower is considered as conferring the greatest honour on his guests.

The varieties of this plant were introduced to Britain from France in 1790, having been brought from China to Marseilles in 1789. Before 1808, eight new varieties were introduced from China by Sir Abraham Hume and Mr. Evans. Between the years 1816 and 1823 seventeen new varieties were added to the list; and from subsequent importations and variations from culture there are now more than fifty varieties in cultivation *.

The mode of culture is simple and easy, and may be explained in the following rules:—

1. The soil most suitable for their growth is a light, rich, turfy loam, mixed with good rotten dung, sand, and leaf mould, in the proportions of one barrowful of the former to one-fourth of a barrowful of each of the latter.

2. *Propagation.* This is performed many ways, but there are four or five principal means, namely, by cuttings, suckers, division of the roots, layers, and occasionally, though but seldom, by seeds.

3. *Cuttings.* Take off the cuttings in April, this is preferable to planting them in the autumn, which is often practised. They should be taken from the upper part of the shoot, and from four to six inches long, according to the sort and strength of the shoots. Cut them off just below a joint, and trim off the leaves from that part which it is intended to insert in the soil.

4. When the cuttings are prepared, plant them in sixty-sized pots, in a soil made somewhat lighter than the one mentioned above, by the addition of a little more sand and leaf mould.

---

* This history is taken from a paper read in June, 1828, before the Vale of Evesham Horticultural Society, by the president, E. Rudge, Esq., and noticed some time since in the Gardeners' Magazine.

5. When potted, place them in a frame, and shut them close down with the lights, giving no air until they have begun to grow; also, whilst in this situation, they must be kept damp, and shaded from the violence of the sun by a mat. If it be not convenient to occupy a frame with them, they will grow very well, although not so rapidly, if placed in a somewhat shady situation out of doors, particularly if the pots be plunged in the ground.

6. In May, those placed in frames, and in June, those placed out of doors, will require their leading shoots stopping, in order to induce them to form handsome heads.

7. About the middle of June they will require shifting into a size larger pots, and the soil will now need to be made a little stronger than the last potting, by adding a little more loam. They must now be placed where they will have the benefit of the sun; and be well watered over head two or three times in a week, if the weather be dry. A south-east or south-west aspect we think preferable to one due south.

8. In August, again, shift them into pots from six inches to one foot wide inside measure, and the same depth, being governed by the size of the plant and habit of the variety intended to be potted. In these pots they will flower, therefore the soil mentioned, Rule 1, must now be used, and the plants well watered, to settle the soil about them.

9. Never in potting pare the roots off with a knife: this is destructive to most plants. If the roots have become matted, loosen them a little with the hand. Also give to each pot a good drainage; for although when they are in full vigour they require a deal of water, yet they always suffer injury if the water be stagnant.

10. *Suckers* are taken from the old plants in April; these may be either planted three in a pot four inches in diameter, or one in each sixty-sized pot. When potted they may be treated precisely as recommended for cuttings, shifting as often as they require it, until they are finally placed in the flowering pots.

11. *Division* of the roots is generally performed in February or the beginning of March. It consists in nothing more than with a sharp knife or other instrument dividing each root into as many parts as it will separate, allowing each part two or three shoots. These may be either planted in pots, or beds, or warm flower borders, where they may either remain to flower, or be removed, at the option of the cultivator.

12. *Layering* is performed about the beginning of July; merely peg the shoots at the third or fourth joint from the top into pots of soil; and, if watered when they require it, they will all be well rooted in three weeks or a month. When separated from the parent plants, place them in a shady situation, repot them when necessary, and treat them in the same way as cuttings.

If it is inconvenient to plant either the cuttings, suckers, divided roots, or layers, in pots; they will do very well if planted in a bed made of light soil for the purpose.

It is always advisable where handsome plants are an object, to allow them to stand at a sufficient distance from each other, when growing, as not to injure each others' figure.

When it is desirable to have very large flowers, their size may be increased by thinning out the small buds soon after they appear.

13. *Watering.* They require at all times a good supply of water, and during summer they are greatly benefited by being regularly watered twice a week at least, over the leaves. In August begin to water the pots with soap-suds, mixed with manure water, about once or twice a week, and continue it until they come into flower, which will be in November.

14. When they have done flowering, set them in a situation where they will not be injured by frost, and occasional watering will be all the care they will require until the season again commences for propagation. It sometimes happens when the buds of plants in pots are all formed, and promise to flower finely, that shortly after the time of removing them into the house for flowering, the greater part die off without expanding. This we judge is occasioned in a general way by the roots being allowed to grow through the bottom of the pots into the soil on which they stood; and on being taken from that situation, the fibrous roots are broken, and the consequence is, a more sudden check to the plant than it was able to bear; the effects of which may be readily discovered by the flagging of the leaves, and the buds changing colour. This may be prevented by timely moving the pots and properly shifting into larger pots at the time required.

The sorts in cultivation are as follows:—

1. Changeable white.
2. Purple.
3. Quilled white.
4. Superb white.
5. Tasseled white.
6. Quilled yellow.
7. Sulphur yellow.
8. Golden yellow.
9. Large lilac.
10. Rose or pink.
11. Buff or orange.
12. Spanish brown.
13. Quilled flamed yellow.
14. Quilled pink.
15. Early crimson.
16. Large quilled orange.
17. Expanded light purple.
18. Quilled light purple.
19. Curled lilac.
20. Superb clustered yellow.
21. Semidouble quilled pink.
22. Semidouble quilled white.
23. Semidouble quilled orange.
24. Late pale purple.
25. Quilled salmon colour.
26. Small yellow.
27. Paper white.
28. Late pink.
29. Early blush.
30. Park's small yellow.
31. Blush ranunculus-flowered.
32. Tasseled yellow.
33. Changeable pale buff.
34. Curled blush.
35. Tasseled lilac.
36. Two coloured red.
37. Pale buff.
38. Windsor small yellow.
39. Clustered pink.
40. Semidouble quilled pale orange.
41. Starry purple.
42. Golden lotus flowered.
43. Brown purple.
44. Two coloured incurved.
45. Late quilled yellow.
46. Yellow Waratah.
47. Double Indian yellow.
48. Double Indian white.
49. Pale buff or orange.
50. Expanded salmon coloured.
51. Pale flamed yellow.
52. Old quilled pink.
53. Pale variety of pale buff.

These numerous varieties, when published in the Horticultural Transactions, being without arrangement, the late A. H. Haworth, Esq., very ingeniously formed a kind of natural arrangement of them, and published it in the Gardener's Magazine, vol. ix. p. 218, which we here extract in his own words.

RANUNCULUS-FLOWERED.

1. *Yellow Indian,* Hort. Trans. vol. iv. p. 330. tab. 12. and vol. vi. p. 346. Of short stature (in its group), with very late and double, but small flowers, and forms, with the next, a distinct species.

2. *White Indian,* Hort. Trans. vol. vi. p. 347. Shorter than the preceding, with very late and similar, but white, flowers.

3. *Waratah Yellow,* Hort. Trans. vol. vi. p. 344. Flowers very late, with the preceding, and of similar size, but has much more entire leaves and larger flowers, which make it a distinct species.

4. *Spanish Brown,* Hort. Trans. vol. iv. p. 486. and vol. v. p. 420. Of short firm stature, and rather early and beautiful flowers, the size of the preceding, and with smallish leaves a little more pinnatifid, and probably a distinct species.

5. *Blush Ranunculus-flowered,* Hort. Trans. vol. vi. p. 328. Of short firm stature, and fine-formed early flower, of a blush colour, and peculiar neatness of form. I think I have two variations of it.

6. *Small Deep Yellow,* Park's Small Yellow, Hort. Trans. vol. vi. p. 327. Taller and weaker than the last, early and small-flowered, with small and blunt pinnatedly-lobate leaves. Perhaps it may be a distinct species, from its small leaves and flowers.

7. *Small Pale Yellow,* Small Windsor Yellow, Hort. Trans. vol. v. p. 415. and vol. vi. p. 335. Also called Aiton's Yellow. Of short stiff growth, and early flowering, and but little merit.

8. *Small Flat Yellow,* Small Yellow, Hort. Trans. vol. v. tab. 17. and vol. v. p. 422. Of shortish growth, and with pure yellow and expanded early flowers, the shape and size of the three subsequent varieties, of which it is presumed to be the origin, as yellow is the most predominant colour in these plants. Their forms are very neat and regular.

9. *The Buff, or Copper,* Hort. Trans. vol. v. p. 420. Also called the Orange, or Buff. Resembles the preceding in every thing but colour.

10. *The Rose, or Pink,* Hort. Trans. vol. iv. p. 344. Also called the Lilac. Resembles the last in all things but colour, and is now the most common kind in cultivation, although introduced after the old purple, hereunder enumerated.

11. *The Pale Pink,* Hort. Trans. vol. vi. p. 336, raised in Mr. Colville's nursery, being a sportive branch from the last, and differing in nothing but colour. This and the three preceding doubtless sport mutually into each other, and are perpetuated by cuttings of their respective sports in the first instance, and offsets as well as cuttings afterwards; but are all liable to sport again, from pale pink through deeper pink, and copper or light orange to bright yellow; but their shoots and leaves are immutable.

12. *Expanded Light Purple,* Hort. Trans. vol. v. p. 153, and vol. v. p. 421.; and Bot. Mag. tab. 2256. Of middling size, and with flowers in the middle season

(of its group), but nearly twice as large as the last, though resembling it in form, and far more handsome.

13. *Quilled Light Purple,* Hort. Trans. vol. v. p. 155.; and vol. v. p. 421. A sport only from the last, but now made permanent.

INCURVING RANUNCULUS-FLOWERED.

14. *Incurving Lilac,* Sweet, Brit. H. Gard tab. 7; Curled Lilac, Hort. Trans. vol. v. p. 155. and p. 421. Also called the Quilled Lilac. Grows tall and flowers early, and is an elegant plant, allied to the preceding, and has produced the following one from a sportive branch.

15. *Curled Blush,* Hort. Trans. vol. vi. p. 326. Has been called the Double Blush, and Double White, the flowers, which are rather early, large, and showy, dying off nearly of that colour. It is of middling stature in its group, and, although a sport only of the preceding, is now an established and more beautiful variety than it.

16. *The Quilled Pink,* Hort. Trans. vol. iv. p. 350. and vol. v. p. 351. 420. 421. and Bot. Reg. vol. viii. tab. 616. Of tall stature, and one of the very latest in blooming, but very handsome, and repaying by its beauty every care bestowed upon it by the gardener. It has been called the most beautiful of all, but with me it yields to the gold-bordered red.

17. *Large Quilled Orange,* Hort. Trans. vol. v. p. 152. tab. 3. (upper figure), and vol. v. p. 421. A tall and large latish-flowering variety, of considerable beauty, and at present uncommon.

18. *Gold-bordered Red,* the Two-coloured Incurved of Hort. Trans. vol. vi. p. 332, 333. Of tall stature, very late, with the most perfect and beautiful flower of all its genus, although only of the middle size. The red petals are striped with gold beneath, and golden-tipped there, which tips, incurving strongly and gracefully, show the gold in a front view of the flower, which is golden likewise at its base within. I consider it the most complete of all.

19. *The Superb White,* Hort. Trans. vol. iv. p. 338. and vol. v. p. 420. A late, very tall, and splendid plant, with large incurving, very double, pure white flowers.

CHINA-ASTER-FLOWERED, OFTEN SHOWING A DISK, AND THEN MUCH RESEMBLING CHINA-ASTERS.

20. *The Sulphur Yellow,* Hort. Trans. vol. iv. p. 341. and vol. v. p. 420. A beautiful variety, of tall stature, and free and early blooming, with middle-sized aster-like flowers.

21. *The Two-coloured Red,* Hort. Trans. vol. vi. tab. iv. and vol. vi. p. 342. 343. A very fine and showy variety, of the middle-size in stem and flowers, but rather late, which sometimes shows a disk, and is then very aster-like. The bipinnatifid flowers are far more laciniated than any other kind, and I think they constitute it a distinct species.

22. *The Early Crimson,* Hort. Trans. vol. v. tab. 3. (inferior figure), p. 151. and p. 421. Of light small stature, delicate, and apt to lose its leaves before its bloom is finished. The flowers are middle-sized, early, and very beautiful; they show a disk, and, when well managed, have ripened perfect seeds in England.

23. *The Clustered Pink,* Hort. Trans. vol. vi. p. 336. Also known by the name of the changeable Blush. One of the tallest of its tribe; flowers in the middle season very abundantly; and although the flowers are but middle-sized, and little better than half-double, showing a considerable disk, and greatly resemble China asters, they make a very fine and durable appearance, standing the weather well, and becoming much darker by age, though less delicate. This is a very likely variety to produce seed in this country.

24. *The Early Blush,* Hort. Trans. vol. vi. p. 326. This tall and almost unequalled variety is also called the Double Blush, and Double White. It flowers very early, beautifully, and freely, and its flowers are large, and scarcely show any disk, and their colour without is light blush, but within they are exactly of that peculiar tint well known by the name of French white, and, like many other varieties, they are very durable. They have ripened seeds in England.

25. *The Paper White,* Hort. Trans. vol. v. p. 417. 422. This exquisitely white-flowering and noble variety is of tall stature, and early blooming, and makes a splendid appearance in a general collection. Its flowers are of the middle size.

MARIGOLD-FLOWERED, WITH WELL-FORMED DOUBLE FLOWERS, RESEMBLING DOUBLE CAPE MARIGOLDS IN SHAPE AND SIZE.

26. *Golden Bronze-back,* Golden Yellow, Hort. Trans. vol. vi. p. 342, and Bot. Rep. tab. 4. (superior figure). Also called the Large Yellow and the King's Yellow. A very tall, handsome, and free-flowering variety. The flowers are early and of a high rich yellow colour, but bronzed or orange in the buds and on their outsides. This is one of the best to grow as a standard, and if parted at the root, and annually transplanted, succeeds very well as a herbaceous plant, especially if in a warm or sheltered situation, duly supported by a stick.

27. *The Superb Clustered Yellow,* Hort. Trans. vol. v. p. 156, and vol. v. p. 421, and Sweet's Brit. Fl. Gard. tab. 14. One of the finest and tallest of the group, being higher than the preceding, and with more clustered and more neatly formed pure yellow flowers, but they are later in opening.

28. *The Golden Lotus-flowered,* Hort. Trans. vol. vi. p. 340. A very splendid and large long-leaved variety, and nearly or quite the tallest of this genus of plants, having late, pure, and deep yellow flowers, above the middle size, and larger than those of any other yellow kind of the marigold form, and which partially endure until the heavier frosts of winter destroy them.

29. *The Changeable Pale Buff,* Hort. Trans. vol. vi. p. 380, and tab. 3; also called the Pale Cluster. This plant, when flowering as perfectly as it is represented on the above cited table, is one of the most showy and splendid of the group; but this has not been the case during the autumn of 1832; and all the flowers, and in various gardens, which met the writer's eye, being as it were degenerated into almost buff-

coloured and spuriously quilled flowers, of more upright appearance than the large, expanded, flat-petaled, and variegated purple-whitish and yellow-buffy ones, so charmingly depicted in the figure cited. They are of the middle season.

30. *Starry Changeable Purple,* the Starry Purple, Hort. Trans. vol. vi. p. 339. This beautiful plant is one of the most variable-flowered in the genus; its very late flowers first opening of a purple colour, with the exterior petals at first few in number, starry, and paler, especially at their spoon-shaped tips; soon, however, becoming still more pale, until the whole well-expanded and very double blossom becomes regularly more blush-coloured and white than purple, and is a very fine, well-formed, variegated flower. The stature of the plant is of a middle size, but its remarkable leaves are much more laciniated than usual, and often broader in their outline than long, which is not the case with any other in the group, and of very considerable size: wherefore I conceive it may be a distinct species from all the others.

31. *The Late Purple,* the Late Pale Purple, Hort. Trans. vol. v. p. 431, and vol. v. p. 422, and vol. vi., p. 353. Also called Large Pale Purple. This is a very late flowering, and rather tall variety, whose middling-sized and well-expanded blossoms are very neat, and resemble in shape those of the preceding, but are much smaller.

32. *The Brown Purple,* Hort. Trans. vol. vi. p. 341. 342. A tall and slender twigged very late-flowering variety, whose middle-sized flowers resemble the last in shape, but are not quite so flat and neat in expansion, and their colour in the group is very remarkable, being of a very dull brownish or reddish purple. The leaves are so small, and so bluntly lobed, and on such slender shoots, terminating in such long and graceful peduncles, that the plant is probably a distinct species from Chrysanthemum sinense, and differs not so much in leaf as in flower from our No. 6. the Small deep Yellow, above.

TASSEL-FLOWERED, BEING TALL OR VERY TALL PLANTS IN THEIR GENUS, WITH VERY LARGE DOUBLE, AND MORE OR LESS CONSPICUOUSLY DROOPING FLOWERS, WHOSE PETALS ARE USUALLY ELONGATED AND QUILLED, AND OFTEN GREATLY RESEMBLE THE FORM OF A TASSEL.

33. *Tasseled Flame Yellow,* the Quilled Flame Yellow, Hort. Trans. vol. iv., tab. 14, p. 349, and vol. v., p. 421. The magnificent flowers of this tall plant apperr rather late, and often measure above five inches in expansion; and make, perhaps, if not a more neat, at least a more showy appearance than any other of the group, being double, and composed of innumerable chiefly quilled incurving petals, hanging more or less downwards, and when at their best resembling a flame-coloured tassel.

34. *The Tasseled Salmon,* the Quilled Salmon, Hort. Trans. vol. v., tab. 17*., (inferior figure), p. 414, and 422. This is a late-flowering slender and graceful plant, with large tassel-like and half-expanded, drooping, quilled, salmon-coloured flowers, and is very common.

35. *The Tasseled Yellow,* Hort. Trans. vol. vi. p. 329. A very tall and strong-growing large-leaved variety, with numerous tassel-formed flowers of the largest

and most showy kind, often measuring more than five inches over, and appearing rather early. It is one of the most desirable and free-growing of the whole collection.

36. *The Quilled Yellow*, Hort. Trans. vol. iv p. 341. and vol. v. p. 420. This is a tall variety, with rather large flowers, of the middle season, or later, producing its blossoms in clusters at the top of the strong upright shoots. It is also known by the name of the Quilled Straw.

37. *The Late Quilled Yellow*, Hort. Trans. vol. vi. p. 343. This has been called a very late and not very desirable variety in collections. It appears to me to be of the middle size, but it has not yet opened its blossom buds with me, not having long possessed it.

38. *The Large Lilac*, Hort. Trans. vol. iv. p. 343. and vol. v. p. 420. Also called the Late Lilac, the New Lilac, and the Semi-double Purple. A very tall upright plant, bearing but few double large and clustered flowers at the summits of the branches, and those so late in appearance, that in cold seasons they cannot expand well, and are consequently in but little repute. I have only seen one plant in blossom, and that in my own garden.

39. *The Tasseled Lilac*, Hort. Trans. vol. vi., p. 332. A middle-sized, or rather tall plant, of very great beauty, and one of the most desirable of the whole group, having very showy tassel-formed flowers, five inches or more in expanse, very numerous, early, and elegantly drooping from their weight, but they often show a disk. It is a likely variety to produce seeds of the most promising kind, but I have not hitherto heard of its ripening any in England.

40. *The Tasseled Purple*, the Purple, Hort. Trans. vol. iv. p. 334. Has also been called the Old Purple, the Old Red, and the Quilled Purple, and is figured in the Bot. Mag. tab. 327. This is a very beautiful and rather early-flowering plant, of almost the middle size. The flowers are very numerous, gracefully drooping, and of middling size, and are at first of a reddish purple colour, but become paler by age, and in mild seasons will continue in succession from the end of October to the second week in January. It acquires the name of old, from being the first China-chrysanthemum that came to England in modern times, and bloomed at Mr. Colvill's nursery, in Nov. 1795, but was said to be at Kew in 1790. The great horticulturist Miller certainly had one, or more likely two, of these Chinese or Indian chrysanthemums in cultivation at Chelsea long before; but it is not yet quite satisfactorily explained what sorts they were. See Hort. Trans. vol. iv. tab. 12, p. 326, and following.

41. *The Changeable Tasseled White*, the Changeable White, Hort. Trans. vol. iv. p. 336, and vol. v. p. 419, and Bot. Mag. tab. 2042. It has also been called the Old White, being the first white-flowered variety known in our gardens. It is recorded in the Hort. Trans. to have been raised from a sporting branch of the preceding, and, indeed, resembles it in every thing but colour. It is a very graceful and elegant plant, and in warm situations its flowers are often more or less tinged or dotted with purple or blush colour.

42. *The Narrow Quilled White*, the Quilled White, Hort. Trans. vol. iv. p. 337, and vol. v. p. 419. This rather slender variety is almost of the middle size, and has

the slenderest and most completely quilled florets, and the earliest flowers, of the whole group, which hang in gracefully drooping tassels, and form a strong contrast to the next in almost every respect.

43. *The Great Tasseled White*, the Tasseled White, Hort. Trans. vol. iv. p. 339, and vol. v. p. 420. Has also been called the Expanded White. This large, strong and broad, deep-green, shining-leaved variety, is one of the latest of all in blooming; but its lovely flowers are larger and more showy than those of any white-flowered variety, and endured to the end of January, 1833, the date of the present paper. No flower in this chilly climate stands the cold so well, or so long continues to beguile the fancy of a florist by its protracted opening, by its hardihood in expansion, and by the soft hue of its snowy blossoms, carrying on, as it were, the flowery beauty of lingering autumn into the very bosom of winter, whose ice at length closes the temple of Flora for a time, until the herald flowers of spring appear amidst the melting snow, as if impatient of delay.

Half-double tassel-flowered, with only half-double flowers, and narrow elongated quilled petals, often drooping, and somewhat resembling a tassel.

44. *Half-double Quilled White*, Semi-double Quilled White, Hort. Trans. vol. v. p. 158. A very tall, robust variety. The flowers are among the latest varieties, and more inclining to be single than usual, yet of too late occurrence to ripen seed with us. They are very large, and the narrow-quilled petals are very singularly waved, as if pursuing each other from right to left, making a pleasing and almost animated appearance.

45. *Half-double Quilled Pink*, Semi-double Quilled Pink, Hort. Trans. vol. v. tab. 17* (inferior figure), p. 157, and vol. v. p. 422, and vol. vi. p. 351. This variety grows rather tall and flowers latish, but its flowers, although but half double, and only of the middle size, possess a degree of graceful elegance and lovely hues peculiarly their own. It is at present a rare variety.

46. *Half-double Bronze Buff*, Pale Buff, Hort. Trans. vol. vi. p. 334. Also called the Semi-double Pale Buff, and Reeve's Pale Buff, and Quilled Buff, and the Buff. It is a very tall and free-growing variety, and its half-double buff large flowers, which in their early stages are much bronzed, though of coarse hues, make a showy appearance, and stand the weather better than all others, opening rather early, and continuing late, until all the bronze is gone, having faded to a dull buff.

47. *Half-double Quilled Orange*, Semi-double Quilled Orange, Hort. Trans. vol. v. p. 412 and 422, and vol. v., tab. 17 ** (left-hand figure), and vol. vi. p. 352. A tallish plant, with but few large and almost single, and also some nearly half-double flowers, of good size, but making a poor show.

48. *Half-double Pale Quilled Orange*, Semi-double Quilled Pale Orange, Hort. Trans. vol. vi. p. 337. Also called Semi-double Deep Yellow. Of the middle stature, with few and late flowers, of good size, but comparatively poor appearance, on loosely drooping footstalks.

Obs. The author has rejected the hybrid word semi-double throughout the paper.

OPERATIONS IN THE FLOWER-GARDEN FOR SEPTEMBER.

Azalea cuttings, planted in July, will now probably require potting off.

Camellias, if wanted to flower early, should be taken into the greenhouse the end of this month, or beginning of October. Grafting and budding, too, are often performed upon them at this time, but we prefer the spring season.

Carnations, layered last month, will require potting off. This is also a good time for preparing the composts, &c.

Calceolarias, cut down in July, will begin to flower about the end of the month. Place them in an airy part of the greenhouse.

China Roses.—Cuttings now put in under a handglass, on a south-east or south-west aspect, strike very freely, and should be potted off in the spring; but the cuttings become fine plants in much less time when they are planted in the spring.

Chimonanthus Fragrans may still be increased by layers and cuttings.

Cyclamen Persicum, if not turned out of the pots into a sheltered border, let it be done as early in the month as possible.

Cactuses of all sorts should now be taken into the greenhouse.

Greenhouse Plants, of several kinds, may still be propagated by cuttings.

Mignonette to stand the winter in pots; if not sown last month, should be sown as early as possible.

Orange and Lemon Trees may still be propagated by cuttings.

Pink Pipings put in last month and July, if properly struck, should be transplanted in beds to remove in the spring. Pot off a quantity of one-year old plants to force.

Ranunculuses planted in frames towards the end, will flower from Christmas to the middle of January.

Ten Week Stocks, sown in pots early in the month, and sheltered in frames, will flower early in the spring.

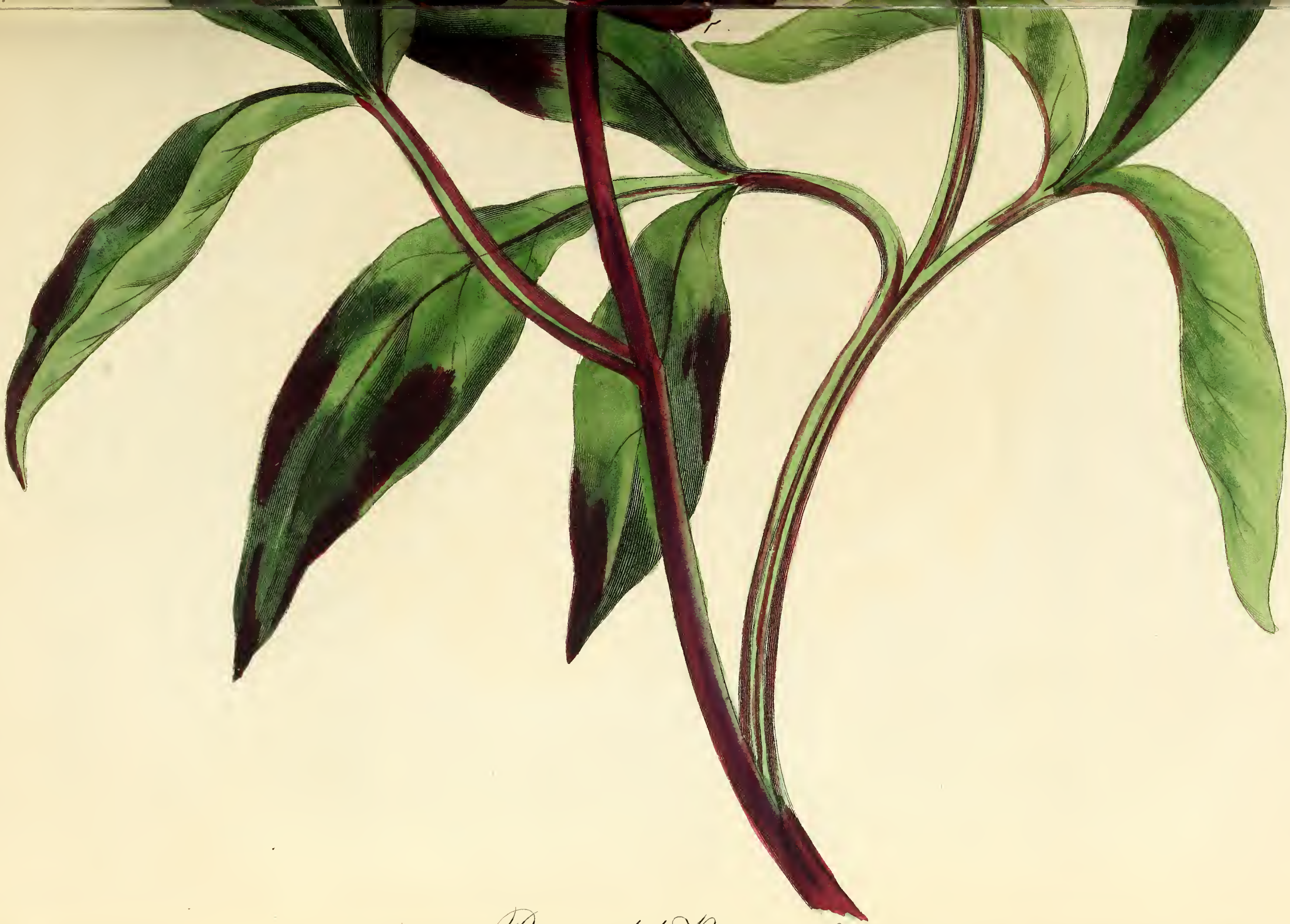
Primula Sinensis.—Cuttings of this plant may be put in about the end of the month.

Ipomopsis Elegans, now sown, will probably make finer plants than those of any other season.

Isotoma Axillaris.—The seeds of this plant may be sown, to flower the following May.

Hyacinths may be planted the middle of the month.

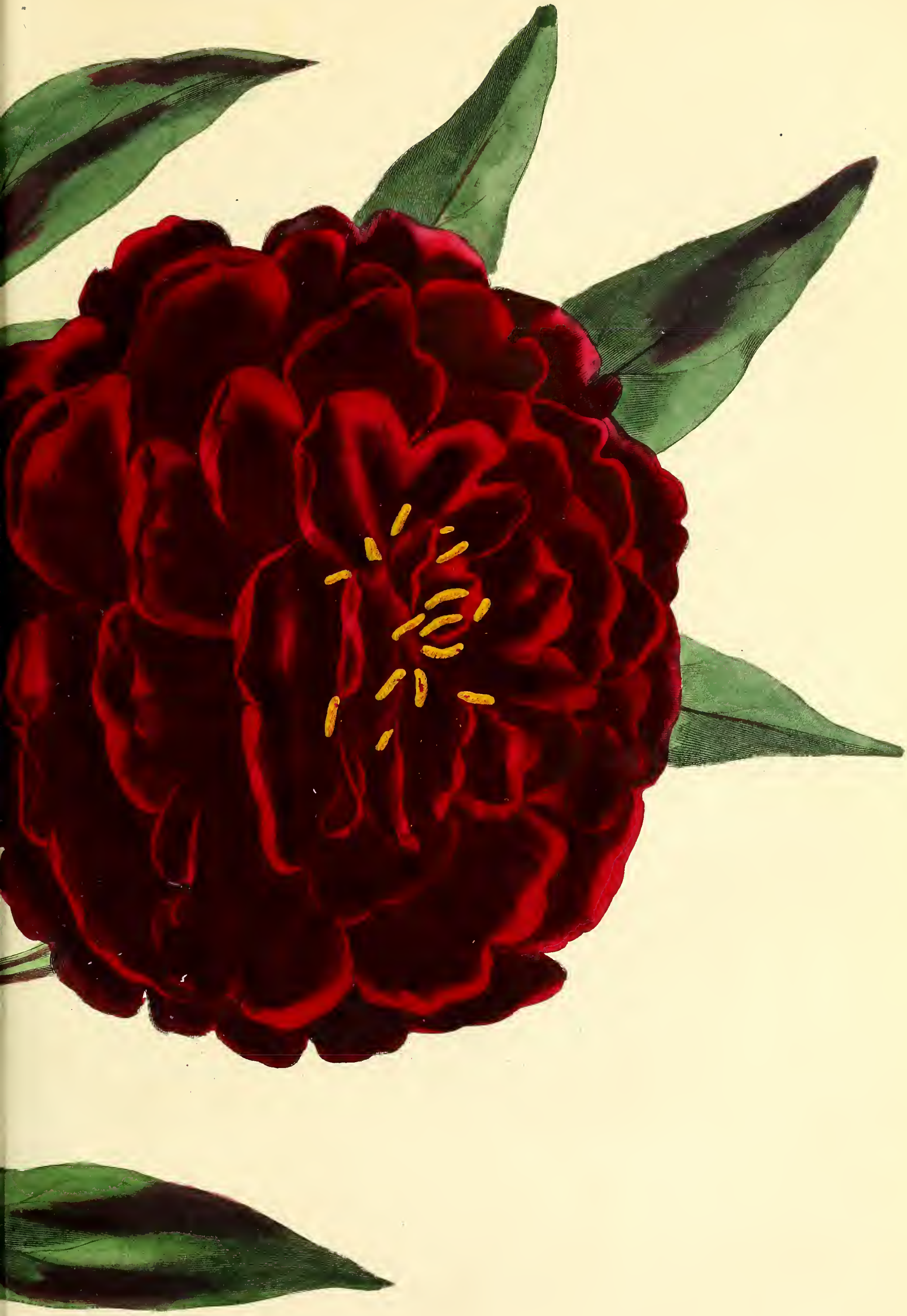
Schizanthus.—The various species may be sown early in the month.

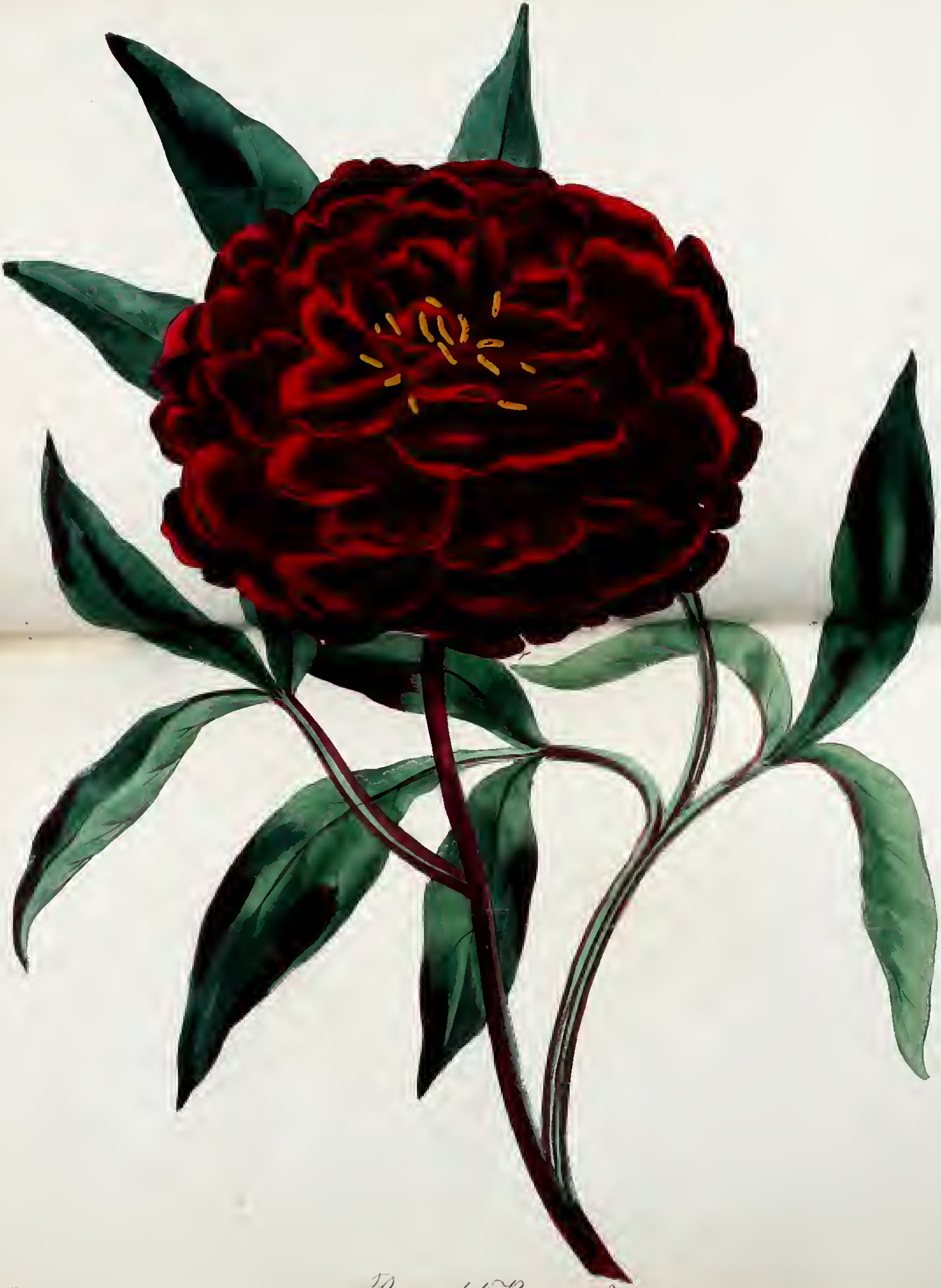


F. W. Smith del.t

Pæonia edulis Reevesiana.

OCT.R 1834.





E.W. Smith del.

Pæonia edulis Reevesiana.

1st 1834

PÆONIA EDULIS REEVESIANA.

(REEVES' TREE PEONY.)

LINNÆAN CLASS AND ORDER.	NATURAL ORDER.
POLYANDRIA DIGYNIA.	RANUNCULACEÆ.

GENERIC CHARACTER.—*Calyx*, of five sepals, leafy, persisting. *Corolla,* of five or of many petals, without claws. *Stamens* below the germen, filaments filiform, anthers oblong, erect, two-celled, bursting outwards. *Style*, none. *Stigmas*, from three to five, sitting, thick, recurved, downy, persisting. *Capsules*, three or five, full of seeds, which are roundish, hard, and albuminous.

SPECIFIC CHARACTER.—*Roots* thick and fleshy. *Stems*, many, half shrubby, bark rugged, exfoliating when two or three years old. *Leaves* and flower as represented on the plate.

No plant, mentioned by Kempfer and Thunberg in their Floras of China and Japan, excited greater interest among European botanists than did the tree peony or Moutan of the Chinese.

The officers belonging to the East India Company, whether residents at, or visiters of, Canton, were frequently commissioned to inquire for, and purchase this plant. Several single plants were received, from time to time, between the years 1785 and 1790, which went to Kew. These, however, being treated as stove plants, uniformly failed; but a fresh supply of plants was purchased at Canton, and brought home by Mr. Main, in 1794, consigned to Sir Joseph Banks and others. Three varieties of these survived the voyage, and were rapidly propagated and distributed in British collections. Since 1820 many additional varieties have been introduced, and chiefly by the well directed exertions of Mr. Reeves, to whom this country is indebted for many other Chinese rare plants, and among them our present subject.

Our drawing was taken from a plant in the collection of Mr. Tate, of Sloane Street, who has several other unique things from the same quarter of the world.

This variety is treated and propagated like the other Moutans, and is certainly a very striking sort and well worth cultivation.

CRATŒGUS OXYACANTHA VAR. ROSEA.

(DEEP ROSE COLOURED FLOWERING HAWTHORN.)

LINNÆAN CLASS AND ORDER.	NATURAL ORDER.
ICOSANDRIA DI-PENTAGYNIA.	ROSACEÆ.

Generic Character.—*Calyx*, tube pitcher-shaped, limb in five divisions. *Corolla*, petals subrotund. *Stamens* seated on a glandular ring within the calyx. *Styles*, from two to five, smooth. *Fruit*, a fleshy pome, somewhat globular, closed, five-celled. *Seeds* single or two together in each cell. *Shell* bony.

Specific Character.—*Leaves* rather smaller and not so deep a green as the common. *Growth* irregular, branches spreading obliquely upwards or horizontal, with points drooping, thickly set with flower-bearing spurs along their whole length. *Habit*, in other respects, like the common hawthorn.

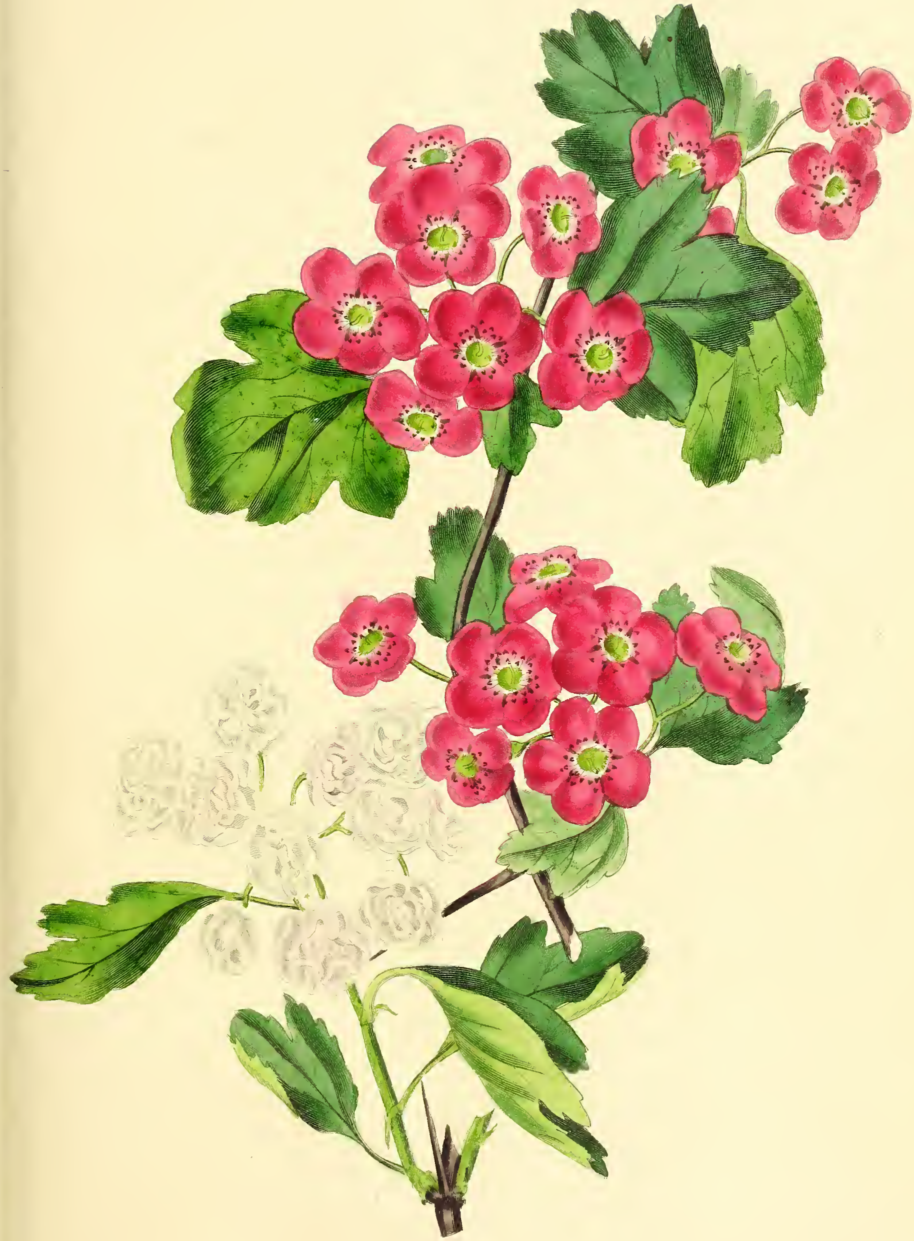
Our drawing was taken from one of a fine assortment of standards and dwarfs, in Mr. Malcolm's, Kensington Nursery, in June last.

We have long had the common scarlet flowering hawthorn in our shrubberies; and many of the wild ones, like the double white variety, may be seen to die off a blush tint. But our present subject is much more deeply vivid rose colour than any other, and no less conspicuous in this respect than admired for the profusion and elegant disposition of its corymbs of flowers along the upper sides of the branches, forming perfect garlands.

The common hawthorn or "May," as it is provincially called, with its snow-white blossoms ranged along each spray, is admired by everybody; but how much more attractive is this scarce and splendid variety, combining the intense colouring of the rose with the delicate elegance of the kalmia.

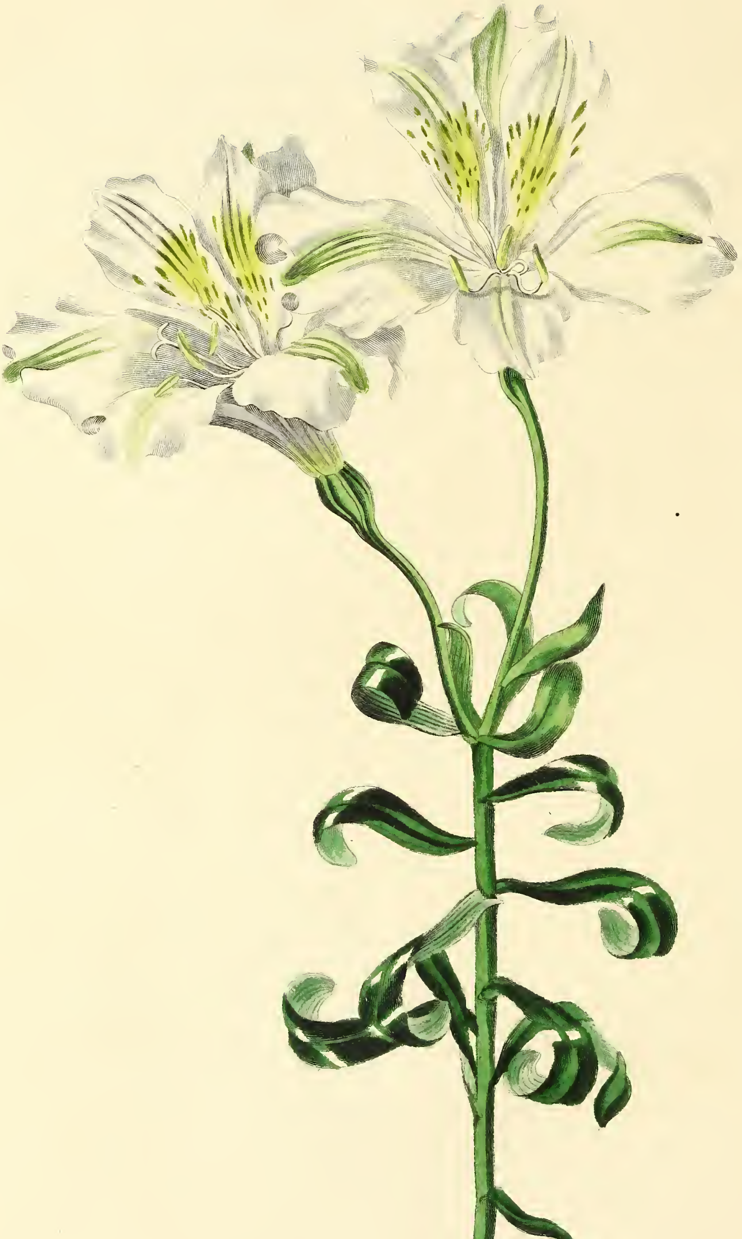
The early history of this ornamental plant is somewhat imperfect. Mr. Malcolm received it from a nursery at Perth (Messrs. Brown and Dickson's?), nearly twenty years ago, and though it has been extensively propagated at Kensington, and no doubt elsewhere, it does not appear to have been noticed, nor so extensively planted as it deserves.

It is propagated by working on the common thorn, either as dwarfs, or as half or whole standards, for lawns, on which no other hardy flowering tree can be more ornamental. It would even add a richness and be no mean embellishment of the flower garden.



Oxyacantha rosea superba.

C.W. Smith del. [illegible]



Alstrœmeria pelegrina alba?.

ALSTRŒMERIA PELEGRINA ALBA.

(SPOTTED FLOWERED ALSTRŒMERIA—WHITE VARIETY.)

CLASS.
HEXANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
AMARYLLIDEÆ.

Generic Character.—*Sepals*, 6, the two lower ones half tubular at the base. *Stamens* unequal, and generally bending downwards. *Stigmas*, 3. *Capsule* roundish oval, six-angled, three-valved, and many-seeded.

Specific Character.—*Stem* erect. *Leaves* linear, lanceolate, alternate, without stalks, and shining. *Corolla* spreading, three outer sepals wedge-shaped, three-toothed; the whole yellowish white.

The present handsome variety has not, to our knowledge, been previously figured in any work. We know comparatively nothing of its history, but from its great beauty it ought to be in every collection of plants. The *A. pelegrina*, from seeds of which we believe it sprang, is a native of Peru, where it grows on mountains. Linnæus introduced it into Spain through the instrumentality of Baron C. Alstroemer, who sent, amongst many other things, seeds of this plant. It found its way into the Royal Gardens, at Kew, in 1753.

The roots of all the species of this splendid genus abound in a nutritive *fæcula*, which may be prepared for food; the natives of Chili obtain from the roots of one of the species a substance resembling arrow-root.

They all thrive, if planted in a mixture of about equal parts of rich loam, sand, and leaf mould. *A. hirtella* and *ovata* do very well on a warm border, and the former will ripen seeds very freely, which, as soon as ripe, should be gathered and sown in pots, and the young plants turned into the borders the following spring.

Although the *Flos Martini*, *pulchella*, or *Hookeri*, *Simsii*, *salsilla*, &c. &c., are generally treated as stove plants, they will grow much stronger and flower finer in the open borders. They endure our winters pretty well with but a slight covering in severe weather.

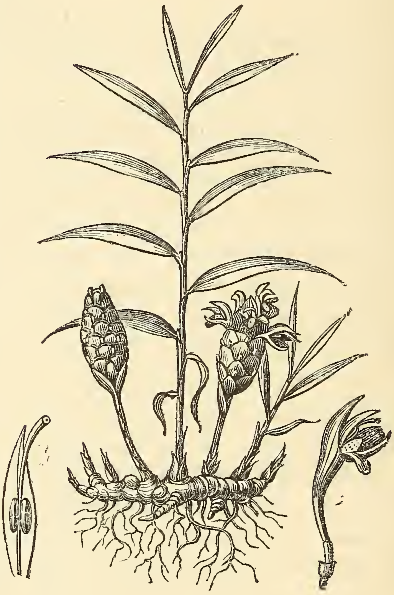
A. ligtu is often very shy at flowering: this may be easily remedied by observing the rules laid down by Mr. Sweet, in his "Botanical Cultivator," page 16, where he says, "*A. ligtu* will blossom freely by letting the pots be dry for a considerable time, till the shoots are all dried up; then fresh pot them, give a good watering, and put them in a moist heat."

Practical observation has confirmed us in the opinion of Mr. Lindley*, that "the safest way to treat (all) the species is, to plant them in light loamy soil, in a border within a glazed pit, which is just heated enough to keep out frost in winter. Here they will grow with great vigour, throwing up strong suckers in all directions, and flowering beautifully; their leaves will not, on the one hand, be parched by the drying cold winds of April, nor, on the other, scorched by the sun at Midsummer. Thus protected, they will perform all their natural functions, as if in their native soil; and an abundance of food will be sent down into the roots, which will be thus prepared, upon the return of the growing season, to send up new shoots with the greatest vigour."

---

* Botanical Register, 1410.

CULTURE OF THE SPECIES OF GINGER (ZINGIBER).



ALL the species of this genus are natives of the East Indies, and many, perhaps the greater part, grow naturally on the Coast of Malabar, in Bengal and Ceylon. Thirteen species are cultivated in our stoves, nearly all of which are very modern introductions; the *Z. officinale* (fig.), however, was brought into this country as early as 1605, and the *Zerumbet* in 1690. Their culture is very simple and easy, and may be stated as follows:—

1. All the species require the heat of the stoves.

2. It grows very freely in a mixture of light rich loam, peat, and sand. Care must be taken to always give a good drainage at the time of potting.

3. During the time the roots are torpid, very little or no water should be given; but when they are in full growth a good supply is requisite to keep them in a healthful growing state.

4. They are easily increased by division of the roots during the time they are torpid. Nothing further is required than to pot the divided parts, in pots suitable to their size, and treat them precisely as recommended for the old plants.

The mode of preparing the roots in Jamaica, for exportation, is as follows: "In January or February, when the stalks are withered, the roots are in a proper state for taking up. After being dug they are picked, cleaned, and gradually seethed or scalded in boiling water; then spread out and exposed to the sun till sufficiently dry. This is the black ginger. The white sort differs little from the black, as the difference wholly arises from the method of curing. The white is never scalded; but picked, scraped, and washed one at a time in cold water, and then dried *."

---

* History of Jamaica.

CULTURE OF CROCUSES.

The crocus has for many ages been cultivated as an ornament to our flower borders; the spring sorts coming into bloom in February and March when but few other flowers ornament our gardens, and the autumnal kinds in September and October. The genus consists of about twenty-six species, and a great number of varieties. Of these about seven species only flower in the autumn, one of which is the *C. sativus* or cultivated saffron, so useful in medicinal purposes. The cultivation and management of both the spring and autumn flowers is simple and easy:—

1. *Soil.* The best kind of soil for their growth is a light sandy loam, well drained.

2. They do not like to be often removed. When they are taken up, which should not be oftener than once in three years, allow them to be out of the ground as little as possible, or they will flower very weakly the following season. The most proper time to remove them is immediately after the leaves have died down.

3. It is immaterial as to the manner of planting: they may either be planted in rows on the edges of walks or beds, in patches on the flower borders, or in beds, which for a collection is to be preferred.

4. Many of the sorts produce plenty of seeds, which it is always the best to sow immediately after being gathered. Obtain some good light soil and fill a quantity of pans or boxes, just in the same manner as recommended for auriculas, page 10, rule 9. Sow thin, cover the seeds lightly, place the pans under an eastern or a south-eastern wall; shelter them from heavy rains, and water lightly as often as they require it. When frosty and wet weather sets in, the pans must be removed, and placed under the shelter of a cold frame.

5. When the leaves begin to show themselves they must be allowed to have full exposure to the air, even in frosty weather, unless it be very severe; but it is not well to allow them to be too much exposed to heavy rains, which are liable to injure the tender plants.

6. When the weather has again become warm, they may be again removed from their winter quarters, and be placed in a similar situation to that they before occupied.

7. When the leaves have died down, take off a small portion of the old soil from the surface, and replace about half an inch thickness of new; and treat them throughout the season of growth in the same manner as recommended the previous year. After the foliage has died the third year, take up the roots and plant them an inch apart in a bed. The following season they may be expected to flower.

8. In watering the seedlings, never administer any but when the soil is dry; and so soon as the leaves begin to turn yellow and die, withhold it altogether until the season of their growth again.

9. If the system of raising the seedlings in boxes, be thought too troublesome,

the seeds may be sown on a dry, warm south border, and then be allowed to remain until they flower, which will in general be the fourth year after sowing.

The most common depredators are sparrows and mice; the former eat the flowers the latter the roots.

Spring crocuses are divided by M. Sabine into three classes; as follows*—

1st Class—Spring crocuses with yellow flowers.

2nd Class—Spring crocuses with various-coloured flowers (not yellow), having the mouths of the flower-tubes without hairs.

3rd Class—Spring crocuses with various-coloured flowers (not yellow), having the mouth of the flower-tubes hairy.

Class First. In this division are included all the species of crocus which either produce yellow or cream-coloured flowers, with their varieties. They are all more or less early, being nearly all in full blossom before the principal varieties of crocus vernus show themselves.

1. Cloth of Gold (*C. susianus*). This species contains two varieties, *vulgaris* and *minor*. It has been called the earliest of the crocuses; but though a few of its blossoms may appear first, yet *C. biflorus* precedes it a few days in the general production of blossoms. It is however soonest out of flower, much before any other kind. Of the two varieties, the first is the most common, and indeed the only one generally known. Neither of the varieties produce flowers very abundantly.

C. susianus vulgaris. Leaves short, narrow, spreading wide on the ground, becoming at length nearly reclinate. The flowers are very little elevated from the ground when they expand. The tube of the flower is marked at the top with brownish purple stripes. Petals deep yellow, lanceolate, obtuse, and nearly equal. The outer are permanently revolute, with a brownish purple stripe, or band, occupying the greater part of their back, and finely, but not deeply, feathered at the edges, towards the top. In the first flowers that show themselves, this stripe is usually entire; but subsequently it appears more divided, and, in some of the latter flowers, these markings are broken into stripes or feathers. The bulbs are of tolerable size, rather flattened; they are covered with a netted coat, the reticulations of which are filled up by a membrane when they are in a state of vegetation. This crocus produces only a small quantity of seed.

C. susianus minor. The leaves of this resemble those of the other sort, but are narrower, and more upright in growth at first, but after become equally reclinate. The blossoms appear somewhat earlier. The roots correspond. The plant is however smaller and shorter in all its parts: the outer petals have a little less tendency to be revolute, and their yellow is a shade paler; the marks on the backs of the external petals are subject to the same variations; but its flower may be particularly distinguished from the other, by the spot at the base of the innner petals, which in this is smaller, less conspicuous, not so much feathered, and paler.

2. Pale Yellow Crocus (*C. sulphureus*). This species contains five varieties, all of which come into blossom nearly at the same time, after those of *C. versicolor*

---

* Horticultural Society's Transactions, vol. 7, part 4.

have opened, but before any of the kinds of *C. vernus* are out. Their flowering is soon passed. They all increase rapidly from bulbs, but do not produce seeds.

C. sulphureus striatus. Leaves narrow, upright, dark green, about the height of the flower when the blossoms appear, afterwards they grow very long, still keeping their upright character; they do not decay early. *Flowers* numerous, do not expand much. *Petals* small, pale yellow, lanceolate, concave and narrow. Outer petals marked with three brown, very neat feathered stripes, the middle one of which is broadest. Inner petals a little broader than the outer, marked at the base with a brown, slightly feathered spot, terminated by a line running a short way up the petal. At the lower part of the petal inside the colour is rather darker, giving the appearance of a yellow cup at the bottom of the flower; this is only perceptible when the flower is opened. *Bulbs* small, covered with a brown silky coat, without any appearance of being netted; the sheaths of the leaves remain permanent, and form long necks to the roots when dried.

C. sulphureus striàtellus. Similar to the preceding, except that it is very indistinctly striped; the brown markings on the tube and petals are not conspicuous; and the feathery stripes on the outer petals are much less perfect. It has but little merit.

C. sulphureus isabellinus. In this the yellow colour is nearly quite free from markings, which are only perceptible at the top of the tube, very imperfectly so, but sufficiently to prevent its being described as entirely yellow. It grows weakly.

C. sulphureus concolor. In this every appearance of the brown colour is obliterated, and the uniformity of the yellow is not disturbed by any markings on any of the flower above the tube, which is white; with this exception, it corresponds with the three preceding. The petals of this variety, as well as those of the first, from luxuriance, are occasionally divided, and so assume the appearance of being more than six; but this circumstance is not constant nor is it at all times observable even among a large number of blossoms.

C. sulphureus albidus. Is paler than the preceding, and is also without any brown marks; the flower has the appearance of having had the yellow colour discharged from the upper part of the petals, which usually seem as if blighted by the weather. This is the "*C. flavus β.*" of the late Mr. Haworth, and the narrow-leaved crocus, with a smaller brimstone coloured flower of Miller. It is also the *C. pallidus* of the fourth and subsequent editions of the "Hortus Cantabrigiensis."

Starry Crocus (*C. stellaris*). This comes into flower early, soon after the *C. susianus,* and produces plenty of blossoms, closely set together. The *leaves* are narrow, numerous, and upright, rising only to the base of the flowers at their first blossoming; they grow long afterwards and continue green till a later period than those of other sorts. The tube of the flower has six brownish stripes at the top. The *petals* are a bright, rich deep yellow, lanceolate, obtuse, entire, concave, never revolute, never open much, but are somewhat stellate under bright sunshine. The outer petals have on their backs five brownish purple stripes, the two external stripes being less distinct, and more feathered. Inner petals broader than the outer, and have an abbreviated, green feathered stripe at their base. *Bulbs* small, multiply rapidly, are covered with a shining silky skin, the inner coat being finely netted.

4. FLASK SHAPE (*C. lagenæflorus*). This comes into blossom early. The *leaf-sheaths* are dingy brown and large. *Leaves* few, rigid and upright, broad, scarcely appearing when the blossoms expand; after flowering they grow long and remain green late. *Flowers* numerous, small, turbinate. *Tube* long and white, but pale yellow at top. *Petals* deep yellow, short, obtuse, very concave, and much imbricated, expanding in the sun; the outer narrowest. *Roots* rather large, even, not angular; skin resembling that of *C. luteus*, but less striated. There is a difference in the hardiness and consequent time of flowering in some roots, but not of sufficient importance to distinguish them as varieties. Those that flower freely should be selected for cultivation.

5. COMMON YELLOW (*C. luteus*). This is the most common crocus cultivated, and is generally known by the name of the Dutch Yellow. It comes into flower with the earliest of the varieties of *C. vernus*, soon after *C. sulphureus*, and continues to produce a succession of blossoms profusely for a considerable time.

6. CREAM COLOURED (*C. lacteus*). Of this there are two varieties, both of which are the least common of any of the cultivated crocuses: some few years ago they were very rare indeed, and are now only to be found in the gardens of collectors of curious bulbs.

C. lacteus concolor. This crocus flowers tolerably freely; it blossoms soon after *C. lagenæflorus*, and continues to produce flowers till nearly every other kind, except the late varieties of *C. vernus*, have ceased to blow. The leaves are narrow, short at first, they grow rigidly upright, then become long, remaining green late. Every part of the flower is cream-coloured, except the mouth of the tube, which is tinged with dull pale yellow. It produces good seeds. The roots have a strong similarity to those of *C. lagenæflorus*.

C. lacteus penicillatus. This is perhaps the most interesting of the crocuses which are cultivated, differing from the other variety by the elegant stripes on the base of the outer petals. It is the *C. lagenæflorus* α of Mr. Salisbury, and the *C. lagenæflorus* γ of Mr. Haworth. It produces its blossoms nearly as early, though after the preceding, and continues in flower as late. The petals are longer than those of the preceding, and though of the same colour, have not quite the same thickness of substance; the inner petals are broader. It produces plenty of seeds. The roots are like those of the other kind.

SECOND CLASS. Spring crocuses with various coloured flowers (not yellow), having the mouths of the flower-tubes without hairs.

To this division belong the plants ranged under the two older species of our gardens, *C. biflorus*, and *C. versicolor*, and the two more recent species *C. argenteus* and *C. pusellus*. They come early into flower, and may be said generally to precede in blossoming the varieties of *C. vernus*. They have all a more or less agreeable fragrance, stronger in *C. versicolor* than in the others, and besides their accordance in the character of the mouth of the tube, have feathered stripes on their external petals.

7. SCOTCH CROCUS (*C. biflora*). The reason of this species being called Scotch Crocus is unknown. It contains three varieties, which are the first to appear in the spring, their blossoms preceding those of *C. susianus*. The earliest have some

flowers open in the end of January, if the season be mild, and are all in full flower in February; they have an agreeable but not powerful scent, and the following common characters:—the outer coats of the roots are circularly divided, their leaves are narrow, spreading and long; the petals white, or nearly so, with brown or purple featherings on their external ones; the insides of the flowers white, except the bottom, which is tinged with yellow; the anthers pale yellow, and of a moderate size; the stigmas deep orange, and conspicuous.

C. biflorus communis. This is the most common in our gardens. It comes into flower later than the other varieties of the species. The leaves at the time of inflorescence are longer than the flowers, they are not numerous, they are at first upright, after a time, when they become elongated, they spread over the ground; they decay early. Petals pure white, oblong, concave, and obtuse, in decay assuming a bluish tinge; the outer are emarginate (which is not the case with the other varieties), at first cream-coloured, with fine distinct purple feathered stripes, extending their whole length, with two narrow short stripes besides on each side; the inner petals are broadest, and have at the base a dull greenish purple spot, feathered and pointed at its apex; the yellow colouring at the bottom of the flower within is also seen externally. It produces seeds freely.

C. biflorus Parkinsonii. Scotch Crocus with white leaf-sheaths. This is the "Ordinary striped Crocus" of Parkinson and Miller. The leaves are narrower than those of the preceding, and are rather more numerous. The petals are white, but not so pure as in the preceding, they having sometimes a slight lilac tinge; the three outer are much more cream-coloured, and have only three purple stripes, of which the middle one is but slightly, whilst the two outer are very much, feathered on their outer side; the spots at the base of the inner petals are narrower, extending higher in the middle part of the petal, and are more uniformly feathered. It produces seeds freely.

C. biflorus stigmatosus. Scotch Crocus, with elongated stigmas. This is similar to the first variety, with the following differences:—It flowers more freely and earlier. The leaves are at first longer, more diffuse, and they are the broadest of the three varieties. The petals are larger, subject to be somewhat deformed, and then appear emarginate; the stripes on the backs of the outer petals are not like those on either of the others; they are five, the two outer being rather undefined, and more feathered. The stigmas are visible at the top of the flower before it expands, and are nearly or quite as long as the petals, extending much above the anthers; they are very deep orange, large, and are sometimes four in number, with a corresponding multiplication of the petals into eight, viz., four outer and four inner. It seldom produces seeds.

8. SILVERY CROCUS. *C. argenteus* has two varieties, the *C. argenteus Bavaticus.* The flowers of this are small, and are produced abundantly and early. The tube of the flowers is rather more purple at the top, and there is less of yellow at its mouth than in any of the varieties of *C. biflorus.* The petals are within of a delicate diluted lilac colour, the outer are narrower than the inner, and have three feathered stripes. It produces only a few seeds. The bulbs resemble those of *C. biflorus,* but are smaller.

C. argenteus præcox. This is a seedling raised by Mr. Sabine from the last. It agrees with it in most points, but the petals are a little narrower, and have more of the lilac tinge. Its peculiar merit is that of producing its blossoms the first of all the crocuses. The flowers are in perfection when those of every other variety have scarcely risen from the ground.

9. SMALL CROCUS (*C. pusillus*). This pretty species is a native of Italy, whence it was sent to the garden of the Horticultural Society, by Professor Tenore, of Naples, who first described and named it. The whole flower is very small; the tube is faintly marked with lilac lines; the petals are concave, the three outer white, marked with three lines, the middle one narrow, without featherings, the outer ones broader, and neatly feathered towards the outer edges of the petals; the inner petals are ovate and pure white; the bottoms of the petals within are yellow. The roots resemble those of *C. argenteus.*

10. PARTI-COLOURED CROCUS (*C. versicolor*). The blossoms of this species have occasionally, though very seldom, eight petals, and four stamina. The varieties of this species are arranged under four sections. The general external characters of the species are as follow:—*Leaves* spread widely, and are not very strong. *Blossoms* are small, and appear early, are more or less sweet-scented, and tinged with yellow at the mouth of the tube. *Petals* vary in colour; but the external ones are more or less striped and feathered. *Roots* rather large, ovate, and covered with a coarse ragged, pale, brown skin. Most of the varieties produce seeds tolerably freely.

SECTION I. Blossoms pale ground, lines tolerably distinct.

C. versicolor Gawleri. This flowers sparingly, rather late, and does not open its petals freely. *Leaves* few and narrow. *Tube* with six faint lilac lines; outer petals have a dull white ground, with three fine irregularly shaped purple feathered stripes; middle one broadest and darkest, two exterior and top of the middle one feathered; inner petals with three dark narrow lines, accompanied with featherings, indistinctly marked on a white ground; the markings become pale purple at the top; the insides of the petals are finely lined, feathered, and tinged with lilac.

C. versicolor similis. The blossoms are smaller and later than the preceding, and produced less freely; they also expand less; the inner petals are marked at the back like the preceding, but have a lighter ground; the inside of the petals is nearly similar, but paler.

C. versicolor neglectus. This is perhaps the best variety of those belonging to this section. The flowers are larger, with more distinct markings on the outer petals; the ground of the petals is also a clearer white; the inner petals are not so much stained or run with colour, but have three very fine purple lines on them, the outside ones having long obscure featherings; the inside of the whole show the markings through.

SECTION II. Blossoms very distinctly marked with dark stripes or featherings.

C. versicolor purpureus. Is very early in the production of its flowers, which are particularly beautiful.

C. versicolor plumosus. Was raised from seed in the garden of Mr. Sabine, at North Mimms; it is by far the most beautiful variety of this species. It blossoms late. The insides of the petals are very beautiful, for though the featherings on them are not bright, or distinctly defined, yet as they extend over the whole of each, they are peculiarly striking.

C. versicolor venustus. The flowers of this are produced early. The tube is marked with dark purple lines; the outer petals have three distinct purple lines on a pale lilac ground; the inner petals are marked also with three lines, having lilac featherings, extending to the edges of the petals; the space between the lines being the only part not occupied with the featherings. It does not produce seeds.

C. versicolor elegans. Comes rather late into flower, but earlier than the preceding. They are larger, and remain later in bloom than those of any other variety of *C. versicolor.* This kind produces abundance of seed.

Section III. Ground colour, tinged with lilac or pale purple, and striped.

C. versicolor violaceus. This comes very early into blossom, immediately after the variety called *purpureus,* and produces abundance of flowers. This does not produce seeds.

C. versicolor Haworthii. Comes into flower about a week after the preceding, and is very productive of flowers, which overtop the leaves, differing in this respect from every other variety of *C. versicolor.* The petals are paler than in the variety called *violaceus.* It produces abundance of seeds.

C. versicolor lineatus. Is very abundant, as well as early in flowering. The general colour of the petals is neither vivid nor distinct. It produces seeds, but not abundantly.

Section IV. Ground of petals white; outer ones with stripes and featherings.

C. versicolor floribundus. This comes into flower between the earliest and latest, and produces abundance of blossoms; it is a very superior variety, by far the finest of all. The flowers stand high, are of considerable size, and very fragrant. It produces seed sparingly.

C. versicolor pectinatus. Was raised from seeds by Mr. Sabine, at North Mimms. It flowers about a week after the earliest, not abundantly. It seeds freely.

C. versicolor Morleon. This blossoms after the first period of flowering, and rather abundantly, but not so much as some others of the species. It produces abundance of seeds.

C. versicolor inconspicuus. Was also raised at North Mimms, probably from the Morleon. It comes into flower rather earlier than the Morleon, which it much resembles, except that the flowers are larger, and the stripes altogether paler and less feathered. It seeds freely.

C. versicolor stellatus. This variety flowers rather late, and the blossoms are small. It produces seeds freely.

C. versicolor propinquus. Is a seedling from the Morleon, raised by Mr. Sabine; it much resembles that variety, except that it is late in flowering, and the markings on the petals are not so decided, or so much feathered. It is not very productive of flowers, but produces plenty of seeds.

C. versicolor affinis. Resembles Morleon, except that the stripes on the outer petals are much more faint, and not so distinct, but broader and more feathered; it is a little later coming into flower. The blossoms are larger than those of the Morleon. The insides of the petals are white, with the yellow stain appearing at the bottom. It does not produce many seeds.

C. versicolor urbanus. This is the nearest to white of the whole collection; it is the Urbanus, or cream-coloured crocus of the Dutch. It comes into blossom early. It produces seeds, but not abundantly.

THIRD CLASS. Various-coloured flowers (not yellow), having the mouths of the flower-tubes hairy.

In this class there is only one species, but it possesses so many varieties, that it is more extensive in number of plants than either of the preceding classes.

11. COMMON SPRING CROCUS (*C. vernus*). This plant grows naturally wild in the large extended meadow on the side of the river Trent, south of the town of Nottingham. The bulbs of the different varieties vary in size, they are however generally small. They all produce more or less seed.

SECTION I. PURPLE SPRING, outer petals nearly of one colour, from dark purple to pale lilac inclusive, being sometimes blotched, and without any, or with very little white; the inner petals being either of a uniform colour, paler than the outer, or feathered. These are arranged, beginning with the darkest, and proceeding to the palest of the section.

C. vernus puniceus. Comes late, and remains long in flower, producing a moderate quantity of blossoms.

C. vernus purpureus. Is in flower rather early in the middle season, producing a tolerable quantity of blossoms.

C. vernus marginatus. Produces its blossoms not very abundant, and after the middle season.

C. vernus Sabini. Flowers tolerably freely and early, but not among the first. The flowers are obovate, standing high, opening well, and when expanded are magnificent, and larger than probably any other sort.

C. vernus grandis. Flowers rather abundantly and early. The flowers are large and fine.

C. vernus obovatus. Is not very productive of flowers, which appear rather late; they are very handsome and larger.

C. vernus concinnus. Is in flower late in the middle season, and its blossoms are tolerably numerous.

C. vernus Phëthon. Flowers freely and early in the middle season. This variety has a great disposition to produce eight petals and four anthers; it has also been known to have ten petals, looking like a double flower.

C. vernus clavatus. Flowers tolerably abundant and early. It has a large, tall, club-shaped lilac flower; largest of all, except the variety called Sabini.

C. vernus violaceus. Produces flowers abundantly and early. The whole flower externally a rich lilac, with dark purple feathered spots at the base.

C. vernus dubius. Flowers tolerably abundantly, and remains in blossom until April. From the lateness of the period to which the blossoms remain, this might be considered as belonging to the last section. This variety has in some collections been called *C. Neapolitanus.*

C. vernus pruinosus. Is tolerably abundant in flowers, it comes late into, and remains late in blossom.

C. vernus fusiformis. Flowers freely, but rather late. The flowers are very slender, and smaller than most others.

C. vernus stylosus. Flowers very early and abundantly.

C. vernus plumbeus. This flowers not very abundantly, but early in the middle season.

C. vernus inflatus. Flowers tolerably abundantly, early in the middle season. The flowers are large, and much swollen out.

C. vernus tulipaceus. It flowers abundantly and early, and is a singular and beautiful variety. The flowers are large and somewhat obovate: the whole pale lilac, externally and internally striped irregularly and curiously with dark purple in the manner of a tulip, and not in featherings, as in most other crocuses.

C. vernus pallens. Flowers not very abundantly, but early in the middle season. It was the *C. purpureus pallens* of Mr. George Anderson's collection.

C. vernus minutus. Flowers rather abundantly, is late, and continues one of the longest.

C. vernus pallidus. Flowers late in the middle season, not abundantly.

C. vernus Neapolitanus præcox. Produces flowers abundantly and early. It has not much merit otherwise.

C. vernus lilacinus præcox. Flowers early and freely. It is the earliest variety of *C. vernus.*

SECTION II. VARIEGATED, bottoms of the petals distinctly spotted with purple, and the other parts of the petals marked with dark irregular featherings on a pale ground.

C. vernus pictus. Flowers early in the middle season, but not very freely.

C. vernus fucatus. Raised by Mr. Williams, of Turnham-Green. It first flowered in the year 1809, and was then named by Mrs. Clarke. Flowers rather late in the middle season. It produces but few blossoms, which are not well shaped, but are long, wide at the top, and contracted at the bottom.

SECTION III. SPOTTED, the outer petals blotched or spotted with dark purple, and the other parts of the same marked with white; the inner petals having something of the same character.

C. vernus dorsalis. Opens its flowers the end of March, and is in full perfection the beginning of April. The flowers are tolerably abundant, very beautiful, obovate, but not large. The lateness of the period at which this variety flowers would almost justify its being transferred to the last section.

C. vernus unguis. Flowers not very freely, but early in the middle season: the blossoms go off soon.

C. vernus unguis major. Does not produce many flowers: they open early in the middle season, and go off soon. Resembles the last.

C. vernus leucorhynchus. Pheasants' Feather Crocus; so called by Mr. Williams, of Turnham-Green, who raised the variety. Shows its head very early, but proceeds slowly to opening, and is in blossom in the latter season, but not late; does not produce many flowers.

SECTION IV. STRIPED. Inner and outer petals regularly striped or feathered.

C. vernus pulchellus. A seedling raised by Mr. Sabine. Flowers early in the middle season. The flowers stand very high (the highest of any) on the tube, and are not produced in great numbers.

C. vernus lineatus. Flowers early in the middle season, not plentifully.

C. vernus striatus. This is the kind usually sold as the striped crocus. Flowers abundantly, early, and is very beautiful.

Section V. Grey. External parts of the outer petals a dingy white or grey colour; internal parts of the same colour, and the inner petals much feathered or striped; coloured at the top of the tube generally, but not in all cases.

C. vernus glorianella. Flowers small, fusiform, and very beautiful; rather plentiful, but late.

C. vernus gloriana. Flowers in moderate quantity, and early in the middle season.

C. vernus variegatus. Does not produce many flowers; these open in the middle season, and are very fine and beautiful.

C. vernus propinquus. A variety of the preceding, differing in a few particulars.

C. vernus ventosus. Approaches to *C. vernus variegatus.* Flowers not abundantly, and rather late.

C. vernus bicolor. Flowers tolerably freely, and in the middle season.

C. vernus reticulatus. Blossoms late, producing few flowers.

C. vernus griseus. Flowers few, short, and thick, early in the middle season.

C. vernus pectinatus. Flowers late and in good quantity.

C. vernus incurvus. Flowers freely and abundantly early in the second season.

C. vernus lincellus. Flowers tolerably freely and early in the middle season.

C. vernus obesus. Flowers freely and late in the middle season.

Section VI. White. Outer petals white (except the base, which in some is marked with purple), inner petals either striped with narrow stripes on white ground, or white.

C. vernus crassus. Flowers moderate in number, and come late in the middle season.

C. vernus Andersonii. The *C. vernus giganteus* of Mr. George Anderson. Flowers abundantly in the middle season, but not early.

C. vernus parvulus. Produces its flowers rather late; they are fusiform, small, and not very numerous.

C. vernus trilineatus. Produces a tolerable number of flowers, but late; they are of a moderate size.

C. vernus obsoletus. Blossoms moderately in the middle season, but the flowers are not of a good shape; they are perfectly white, except at the base of the petals.

C. vernus albus major. The flowers are produced early in the middle season; they are largish, and rather numerous; the petals are short, very transparent, broad, and obovate; the whole flower pure white, without any colour.

C. vernus albus minor. Blossoms rather abundantly, and late in the middle season. Flowers small and club-shaped; petals pure white, free from any sort of colour, narrow and lanceolate.

Section VII. Late Spring Crocuses.

C vernus delectus. Flowers tolerably abundantly, opens its blossoms the end of March, when all the preceding varieties, with the exception of a few only of their late flowers, are quite over. It is in perfection the beginning of April. The blossoms are purple, and very beautiful. Upon the whole, this variety is one of much excellence; its time of flowering, its fine colour, and beautiful markings, combine to render it of great value.

C. vernus Neapolitanus. Flowers tolerably abundantly, and remains perfectly in blossom into April. It is probable this is of Italian origin, and is very likely the one to which this name properly belongs.

C. vernus Alpinus. A free flowering kind, opening its blossoms the end of March, and continuing perfect far into April. This was called *C. Alpinus*, by Mr. George Anderson; he understood that it came from Switzerland, and thought it distinct from *C. vernus*.

C. vernus Aprilis. Is not in full flower till the beginning of April, and produces its blossoms very abundantly till the middle of the month. Too much cannot be said in commendation of this variety: during the whole of the first part of April it renders the garden gay with its richly coloured and numerous blossoms.

C. vernus tardiflorus. Is the last to appear, coming out in April, and is in perfection in the middle of the month. Is tolerably free in flowering. This is a very fine variety, but neither so rich nor prolific in flowers as the preceding, but it has the merit of being something later in blossoming.

The only distinguishing character of this section is the lateness of their flowering; and though the varieties at present belonging to it are all dark coloured, and would, were it not for the time when their blossoms are produced, have been classed with the purples; yet, as it is possible that seedlings may be obtained, possessing the same property of late flowering, with all the variations of colouring belonging to the other sections, Mr. Sabine thought best to separate them.

DESIGN FOR FORMING SUBSCRIPTION GARDENS IN THE VICINITY OF LARGE COMMERCIAL TOWNS.

The numerous provincial horticultural societies that have been established, have done much to improve the taste for horticultural pursuits in those districts; but unfortunately commercial men are so situated in the centre of large towns, that however desirous they may be to cultivate that taste, they are almost entirely prevented from doing so by nearly insurmountable obstacles. If they have a garden at all, it must necessarily be in some nook or corner, in the outskirts of the town, where they have no other property but the garden; and the person, who is generally employed at considerable expense to manage it, frequently occupies about twice as long in doing the necessary work as he ought to do, and even then it is often kept in very indifferent order. Indeed, the proprietors of such gardens generally know little how it should be managed, and are therefore more readily imposed upon. But this is not the worst evil that attends a garden so situated; for, after all the expense and trouble that has been sustained, it not unfrequently happens that some depredator steals into the garden, and carries off nearly the whole year's produce in one night; this is so repeatedly done, and is so discouraging, that it generally prevents such persons from introducing into their gardens anything considered valuable, or that would furnish their tables with little luxuries. We have been repeatedly told by individuals, that this was the only reason why they were deterred from having a garden; and that unless some means were devised to prevent the nightly robberies, it would be futile to attempt having one with any degree of satisfaction. It is much to be lamented that such is the fact; its being so is the reason why we are induced to suggest a plan which, if adopted, would entirely prevent this species of annoyance, and at the same time would be less expensive, better managed, and give far more security and satisfaction to persons so situated, than it is possible for them to have under the present mode of management. Subjoined is a plan we would recommend for dividing twelve acres and a half of ground into fifty small gardens, each garden containing one-fourth of an acre. This space would be sufficiently large to produce vegetables and common fruit for most small families. There would be no difficulty in establishing a garden of this kind near every large town in the kingdom; and such as Birmingham, Manchester, Sheffield, Liverpool, Leeds, Nottingham, &c., ought to have three or more of them, for the different classes of society; and no town, however small, should be without one or more, as the size of the garden might entirely depend on the number of persons who wish for little gardens. In most large towns there are gas companies, water companies, &c., and we can see no reason why there should not be garden companies.

A good way to establish such a garden we conceive would be, to have it consist of as many shares as there would be divisions in it; and should any subscriber wish to dispose of his allotment, he could readily do so, either by private contract or public auction. The whole garden should be enclosed with a wall, on which choice fruits might be grown. The cross divisions would be better planted with dwarf apples, or some other kind of fruit trees; they would form an excellent hedge, and also produce a considerable quantity of fruit. In the centre of these gardens should be formed a botanic or flower garden; for if about four acres, in addition to the little gardens, were devoted to the purpose of holding the most beautiful plants, it would greatly induce persons to become subscribers, for the purpose of having the pleasure to walk in this garden after the toils and anxieties of the day.

Subscribers to this botanic garden might be admitted who did not wish to have a share in the little gardens; this would greatly assist the funds for keeping it in proper order. Schools might also be allowed to walk in this department until a certain hour in the day, by paying a small yearly contribution.

The expense of keeping in order a little garden so situated, would be according to the inclination of the individual possessing it, for each must have the entire control of his own compartment; but for the assistance of all who wished for information, it would be necessary to have a first-rate gardener to give all the instruction required, as well as to have the entire management of the ornamental part, and be responsible for the labourers employed by the different subscribers properly attending to their duty; this would be very satisfactory to a proprietor, knowing, that although prevented from attending himself, his garden would be as well managed as the best private garden in the kingdom.

The annual expense of keeping the fourth of an acre in good order, and cropping it well, would be nearly as follows, providing the labour was all hired; but most tradesmen have what is called an odd man about their premises, who would, under the superintendence of a practical gardener, be able to do the greater portion of the work, but who, in a garden now, would be of no use whatever, and others would wish to attend in part to it themselves, and some of course would hire all; if the latter was the case, the labour at 14*s.* per week would be—

	£.	*s.*	*d.*
Labour	9	2	0
Rent for a quarter of an acre, poor-rates, land-tax, &c.	2	0	0
For keeping up the ornamental part, tools, seeds, and incidental expenses	5	0	0
Making a total of	16	2	0

In this calculation the highest rate of expenditure is stated.

Some of the subscribers would like to have a green-house, or vinery, attached to their gardens; this could readily be done, as will be seen by reference to the plan; of course the expense would be considerably augmented.

We have been informed by persons who have had about a quarter of an acre of garden detached from their dwellings, that the yearly expense has been more than double the sum here stated. One labourer would manage four of the gardens well, and there would be no difficulty for as many of the subscribers to join and have a man, to whom, if they did not wish to take the trouble of giving the necessary orders, the head gardener would properly direct him for them.

The peculiar advantages of this plan are very obvious. A person living in the centre of a town could as well have his table supplied with excellent fresh vegetables, with the pleasure of knowing they were the produce of his own garden, and perfectly secure from nightly robberies, and in addition have the abilities of the first-rate gardener to manage it, besides having the pleasure of walking in the ornamental department with his family, whenever his leisure or inclination suited.

Near large manufacturing towns we should like to see a considerable number of acres divided into small gardens, for the industrious labouring mechanics. For want of some attraction like this, they are often forced to the alehouse to spend their money, whereas if the same time was occupied in the cultivation of their gardens, it would be at once a source of healthy and profitable amusement, and also tend in a great measure to prevent those dissipations which are too frequent in manufacturing districts.

Chatsworth, July 12*th*, 1834.

References to the Plate.

1. Little gardens, about a quarter of an acre each.

2. Gardens, with green-houses or vineries attached.

3. Conservatory, open for all the subscribers.

4. Tulip garden. All the subscribers who wished to have little beds of tulips, might be accommodated with ground for the purpose, the size and arrangement of the beds to depend on the number of persons desirous of such accommodation. The beds might be filled with late-flowering annuals after the tulips were taken up.

5. Ranunculus garden. The same observations will apply to this.

6. Carnations.

7. Pinks. This, as well as the carnation garden, should be divided according to the number of subscribers who wished to have beds of these flowers.

8. Belt of planting, to prevent the little gardens being seen from the ornamental part;—a complete botanical collection might be arranged round it.

9. Masses of the most showy and beautiful plants.

10. Gardener's house.

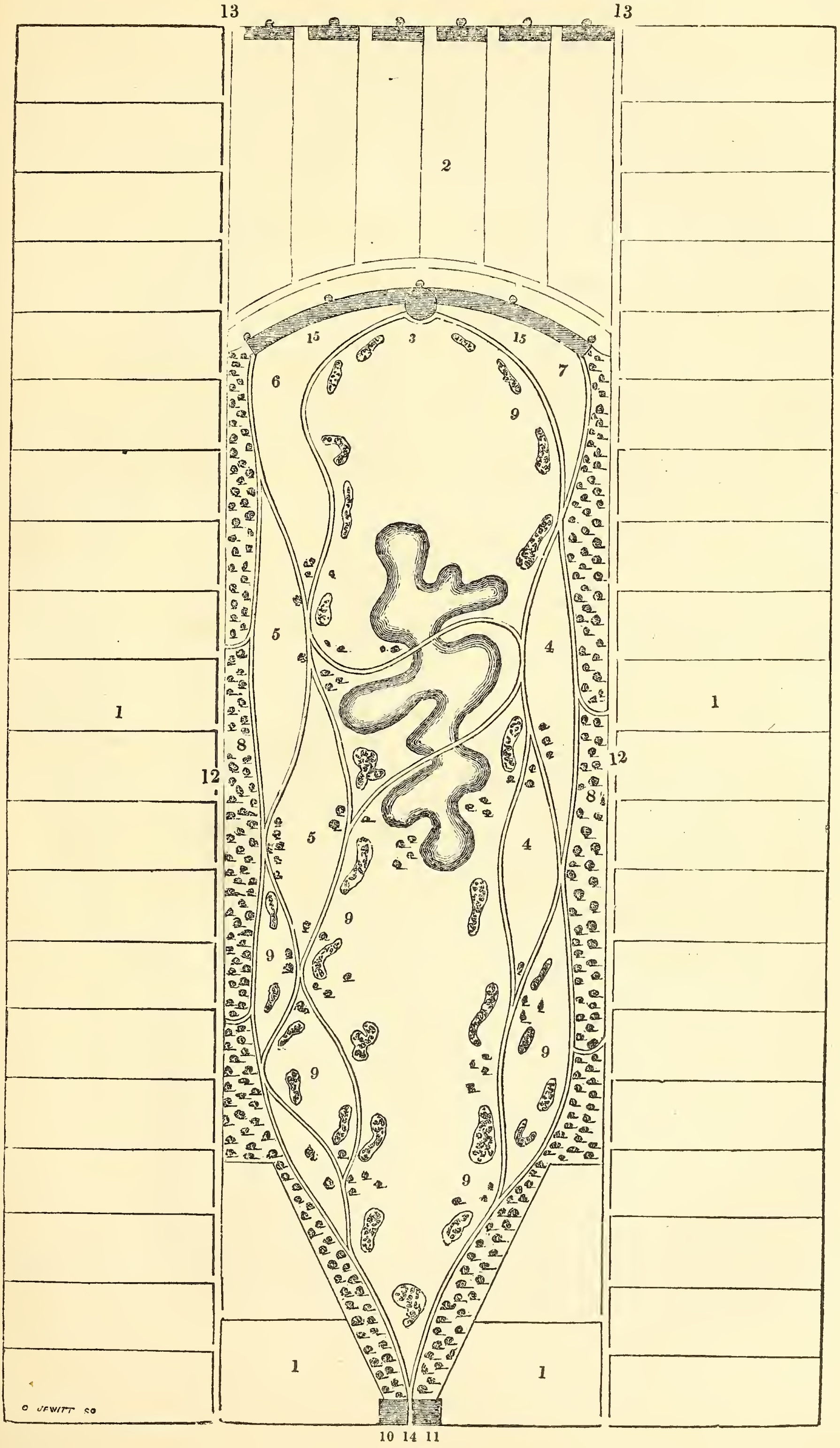
11. House for the use of the committee, stores, &c.

12. Walk to the little gardens, for conveying dung, &c., and otherwise communicating, without going in at the principal entrance.

13. Private doors for the subscribers to go to and from their gardens, for vegetables, fruit, &c. It would be necessary for each subscriber to have a key, and be allowed to enter from any stated hour in the morning until a certain hour in the evening, when they should be locked by the gardener with a master-key.

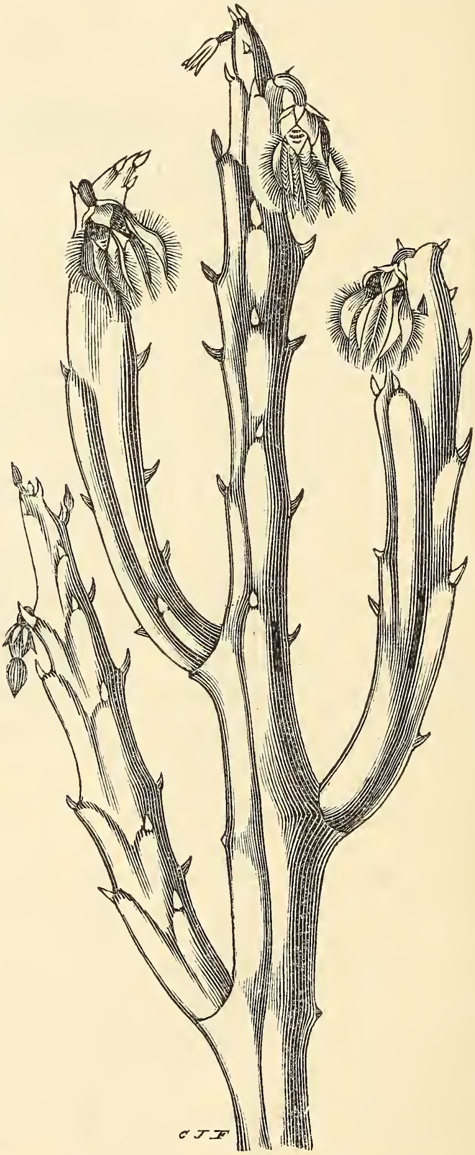
14. Principal entrance.

15. Green-house.


O. JEWITT SC
10 14 11

CULTURE OF THE GENUS CARALLUMA.

This genus of succulents consists of four species, and is very nearly allied to Staphelia. All the species are natives of India, and grow, for the most part, in airy and exposed situations, where for many months they obtain little moisture. To grow them to perfection, therefore, the following rules must be attended to:—



1. Always keep the plants in a warm and dry part of the stove, but where they can receive a good portion of air if required.

2. Always mix a good portion of brick rubbish with the mould in which they are potted, and use a loamy soil rather poor than otherwise.

3. In potting great care is necessary with regard to drainage. Any neglect in this will soon prove fatal to the plants.

4. Water with caution. None of the species require water above once a week in fine weather; but in wet and cold weather scarcely once a month. At the time of flowering, however, they should be liberally supplied, although no pan or feeder should be allowed even at that time, to be placed under the pot, to stop the circulation of the water.

5. The mode of propagation is by cuttings. When these are taken off, they must be laid on a shelf, or other convenient place, awhile, to dry, like other plants of the same habit. When the wound is dry, and the cuttings begin to shrivel, pot them singly in small pots, filled with the same soil as recommended for old plants; place them upon a shelf near to the glass in the stove, slightly water them, and they will root immediately.

6. When rooted, put them into larger pots, as they may require it, and treat them in every respect as old plants.

The *Caralluma fimbriata* is beautifully figured in Messrs. Loddiges' Botanical Cabinet, t. 1863, from which we venture to copy our wood-cut.

A POPULAR FALLACY RESPECTING THE SUNFLOWER.

Who has not heard that the sunflower keeps her face turned invariably towards the sun? From the peer to the peasant it is believed—science has vouched the fact—ignorance implicitly credits the assertion—poets gladly seize, and dilate upon so eloquent a theme; and we dote upon such elegant lines as the following:—

> " The heart that has fondly lov'd never forgets,
> But truly loves on to the close;
> As the sunflower turns to her god when he sets,
> The same look which she turn'd when he rose."—T. Moore.

Thus are our senses taken captive, and we are led willing dupes in the track of those who chance to take the lead.

That able botanist, and amiable man, the late Sir James Edward Smith, has unaccountably fallen into the popular error of believing in the above-mentioned truly feminine and graceful quality of constancy, attributed to the sunflower. In his "Introduction to Botany," 2nd edition, p. 209, he says,

" Nor is this effect of light peculiar to leaves alone. Many flowers are equally sensible to it, especially the compound-radiated ones, as the daisy, sunflower, marigold, &c. In their forms, nature seems to have delighted to imitate the radiant luminary, to which they are apparently dedicated; and in the absence of whose beams, many of them do not expand their blossoms at all. The stately annual sunflower, *helianthus annuus*, displays this phenomenon more conspicuously, on account of its size, but many of the tribe have greater sensibility to light. Its stem is compressed in some degree, to facilitate the movement of the flower, which, after following the sun all day, returns after sunset to the east, by its natural elasticity, to meet his beams in the morning.

" Doctor Hales thought the heat of the sun, by contracting the stem on one side, occasioned the flower to incline that way; but if so, it would scarcely return completely at night."

Voltaire's pleasant exemplification of superstition here presses itself forcibly on my recollection. A giant, seventy feet high, is reported to exist; the learned soon begin to discuss and dispute about the colour of his hair, the thickness of his thumb, &c. They exclaim, cabal, and even fight on the subject. A stranger modestly doubting whether the giant in dispute really exists, draws down the whole weight of wrath, of all the angry disputants, upon his devoted head; and, after having despatched the offender, they fall again to disputing and speculating upon the thickness of the giant's nails, and size of his little finger.

So, of our giant, let us be certain that it exists, before we go into disquisitions with Doctor Hales, respecting the " contraction of the stem, by the heat of the sun, to enable the flower to incline," &c.

Three years since we had saved an unusual quantity of the seed of this plant; and having heard, that by feeding poultry upon the ripe grains, the flavour of game would be imparted to their flesh : having, moreover, ample space to make the experiment, we sowed an immense number in different parts of the premises,—in shade, in sun, in beds, clumps, rows, and shrubberies : every variety of soil and situation, which we could command, was afforded it; and a glaring, tasteless, frightful display of disks, was the consequence.

The experiment however was serviceable, it enabled us to prove the inaccuracy of two popular assertions, that the flesh of poultry, fed on the seeds, acquires the flavour of game; and that it was the nature of the flower to turn towards the sun. We made it a particular point to watch the plants, in the then full expectation of proving the truth of the remark—not with a view to refute it: for as others are, we were—i. e. *firm believers in the existence of the giant,* or rather in the delicate susceptibility of the plant, to the influence of the sun. I remember, that a rigid, sullen, down-looking, broad, ugly, brown face, with a scanty, short, bristly-looking beard of dingy yellow, resolutely keeping its head bowed towards the earth, first made me sceptical on the subject of its poetical constancy: I raised, and propped its drooping ill-looking face, and hoped to find that the morrow's sun had cheered it. No—it loathed the bright luminary, and lived and died without having caught a stray beam upon its face. This led us to investigate others. We looked at all hours, and found them ever the same: as the buds unclosed, so the flowers remained, looking to every point of the compass. The same disk that nodded to the north-pole star, where it opened, retained its unvarying position, apparently more attracted by its magnetic influence, than by the electrical light of the sun, that was travelling in the south. The same fierce face that would be glaring at me, and looking due east in the morning, still stared due east when I went to visit it in an afternoon, and again by the light of the moon at night.

So fair an opportunity of watching and remarking so great a number of plants, as we at that time possessed, is seldom afforded; and so well did we profit by our opportunity, that, without fear of contradiction, I repeat, that whoever will carefully examine the inclination of a number of sunflowers, will find that the heads do not vary from the position in which they first appear—that that position indiscriminately points in every direction, and that the rigid unyielding fibrous stalks remain "*uncontracted* by the heat of the sun," and possess no elasticity whatever.

July 28th. VIOLA.

OPERATIONS IN THE FLOWER GARDEN FOR OCTOBER.

Auriculas, about the beginning, should be placed for shelter through the winter in a frame or pit, sunk or built about two feet below the level of the ground, page 9, rule 3.

Azalea cuttings, planted in July, will now require potting off; and place all the tender sorts in a pit or greenhouse, page 126, rules 4, 5, and 9.

Camellias.—As soon as the weather begins to be very cold and wet, the plants must be taken into the house or frame, or any other cool but sheltered situation, where they may remain till it is wished to bring them into flower, page 34, rule 14.

Carnations.—About the middle of the month prepare a frame for the reception of the plants. Set it in a warm situation, and lay a good floor of ashes for the pots to stand upon, page 72, rules 30 and 31.

Chrysanthemums, in pots, will require removing into the greenhouse, or other situation where they are intended to flower. They require abundance of air, page 189, rules 13 and 14.

Calceolarias, cut down in July, will now come finely into flower. Keep them in a cool, airy part of the greenhouse.

Cyclamen persicum and its varieties may be taken up from the borders about the middle of the month, and be re-potted; if already in pots, place them in a warm greenhouse until they show flower, page 180, rules 2 and 3.

Dahlias.—Lay about three or four inches thickness of rotten bark or leaf mould over the roots, and for two feet round the stem of each plant; this is done to prevent the crown of the plant from being damaged by sharp and sudden frosts, and by the end of the month they will probably require taking up, page 107, rules 29 and 30.

Green-house Plants.—Not later than the first week prepare to remove them into the greenhouse. Clean, and properly tie them up previous to setting them on the stage. After they are placed in the house give them abundance of air night and day, and continue to decrease it as the weather becomes colder, page 138.

Forcing.—Plants intended for forcing must now be taken up, as rhododendrons, pinks, carnations, &c.

Cactuses, placed out of doors in June, must be taken into the green-house early in the month, if not done before, and be placed in a situation where they will receive plenty of light and air during winter, page 50, rule 7.

Hyacinths may be planted in beds in a light dry soil, in rows, 18 inches apart, and six inches from root to root; or they may be planted in pots, four inches deep and three inches wide, and be plunged in the open air, and covered with six or eight inches of rotten bark, page 41.

Isotoma axillaris, Schizanthus of different species, and some other handsome annuals, may still be sown in pots, to flower in the following May and June, page 19.

Mignonette in pots, to stand the winter, must be sheltered from heavy rains and frost, but must have plenty of air.

Roses in Pots, for forcing, if placed in the forcing-house, will produce flowers about Christmas. About the end of the month take up some strong suckers or layers, and plant them in pots about five inches diameter, inside measure (upright forty-eights), filled with good rich light loam, mixed with a small portion of vegetable mould, or well-rotted dung. Afterwards plunge the pots up to the rim in an open airy situation, page 144, rules 42—46.

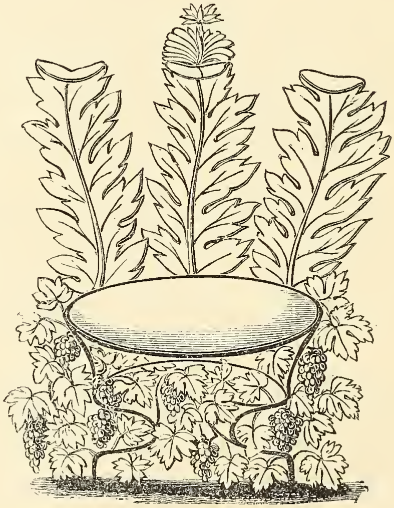
Primula prænitens.—Cuttings of this plant may be put in in the beginning of the month, page 181, rules 1—6.

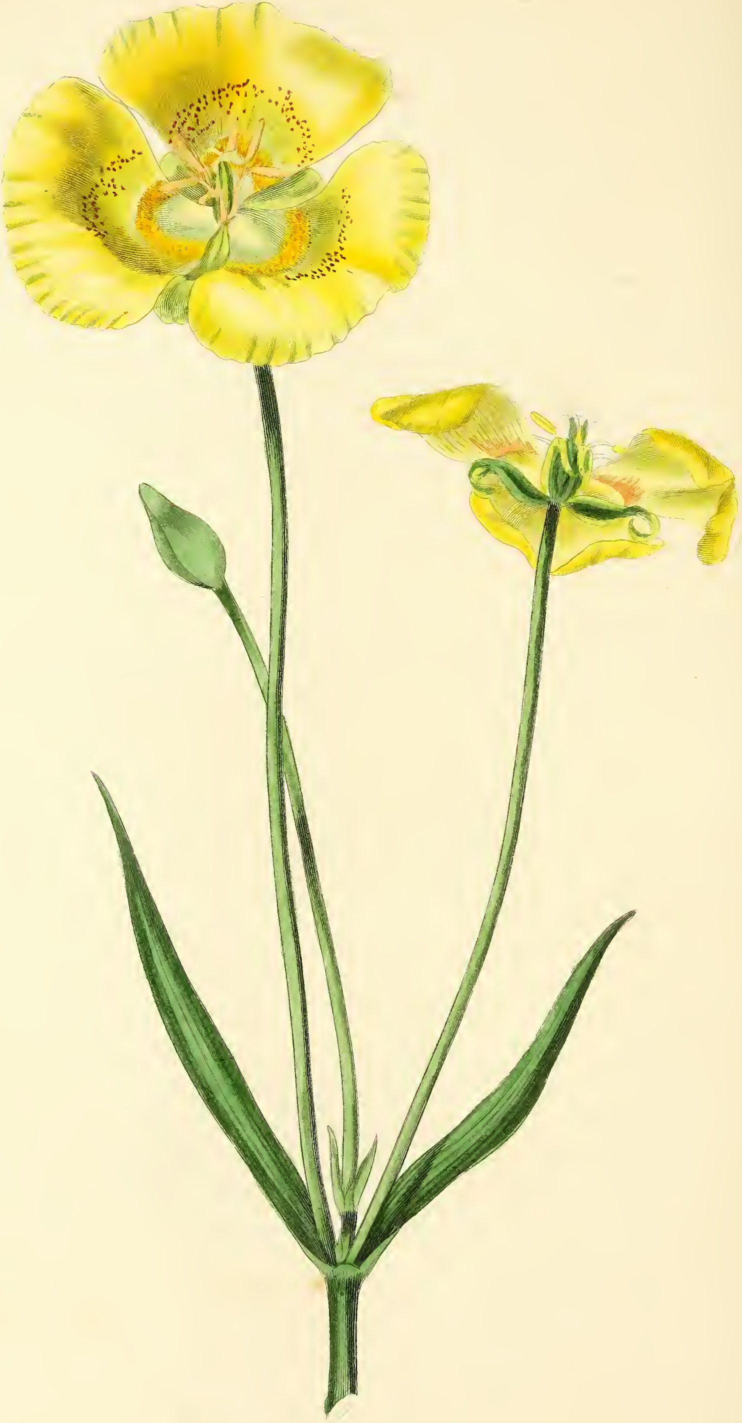
Ten weeks Stocks, sown last month, must be preserved from rains and frosts, but must be exposed to as much air as possible, page 20.

Tigridia pavonia, growing in the borders, should be taken up, if not done before, and be laid in any airy situation to dry, in the same manner as tulips, &c. After they are dry put them in paper bags, and lay them out of reach of frost during the winter, page 85, rule 6.

Tulips.—Any time after the middle of the month tulip seeds may be sown. For this purpose use shallow pans or boxes, filled with light sandy soil. Also, at the end plant the old bulbs, page 161, rules 4, 11, and 12.

Since we inserted the figure of Mr. Saul's garden chair, page 123, we have received another design, which differs from the last, in having the seat supported by the pattern of a vine branch, which gives it a very pleasing effect on a lawn.





Calochortus luteus

CALOCHORTUS LUTEUS.

(YELLOW FLOWERED CALOCHORTUS.)

CLASS.
HEXANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
LILIACEÆ.

Generic Character.—See page 175.

Specific Character.—*Stems* a foot to a foot and a half high, having three or four stiff, curled, acuminate leaves. *Flowers* terminal, usually two or more on a stem, resembling a cup. *Calyx* light green, all the three segments much narrower than the petals, usually curled up. *Petals* three, clear yellow towards the tip, middle of the petals inside the cup greenish, spotted with dark blood colour, and having a band of yellow hairs; the base of each petal yellowish green, glossy, and perfectly free from hairiness.

This is another very interesting species of this beautiful genus. It was introduced from California by Mr. Douglas. The plant from which our drawing was taken flowered in the green-house at Chatsworth; there is no doubt, however, but it will be found perfectly hardy, and if treated as recommended for the *C. venustus*, page 175, little difficulty will attend its culture.

The blossoms open in August and September, and remain without fading for ten days or a fortnight.

The best soil for it is a sandy peat.

It produces seeds, by which and offsets it may be increased.

CALANDRINIA GRANDIFLORA.

(GREAT-FLOWERED CALANDRINIA.)

CLASS.	ORDER.
DIDYNAMIA.	MONOGYNIA.

NATURAL ORDER.
PORTULACEÆ.

Generic Character.—*Calyx* two parted. *Petals* three to five. *Style* short. *Capsule* oblong, one-celled, many-seeded.

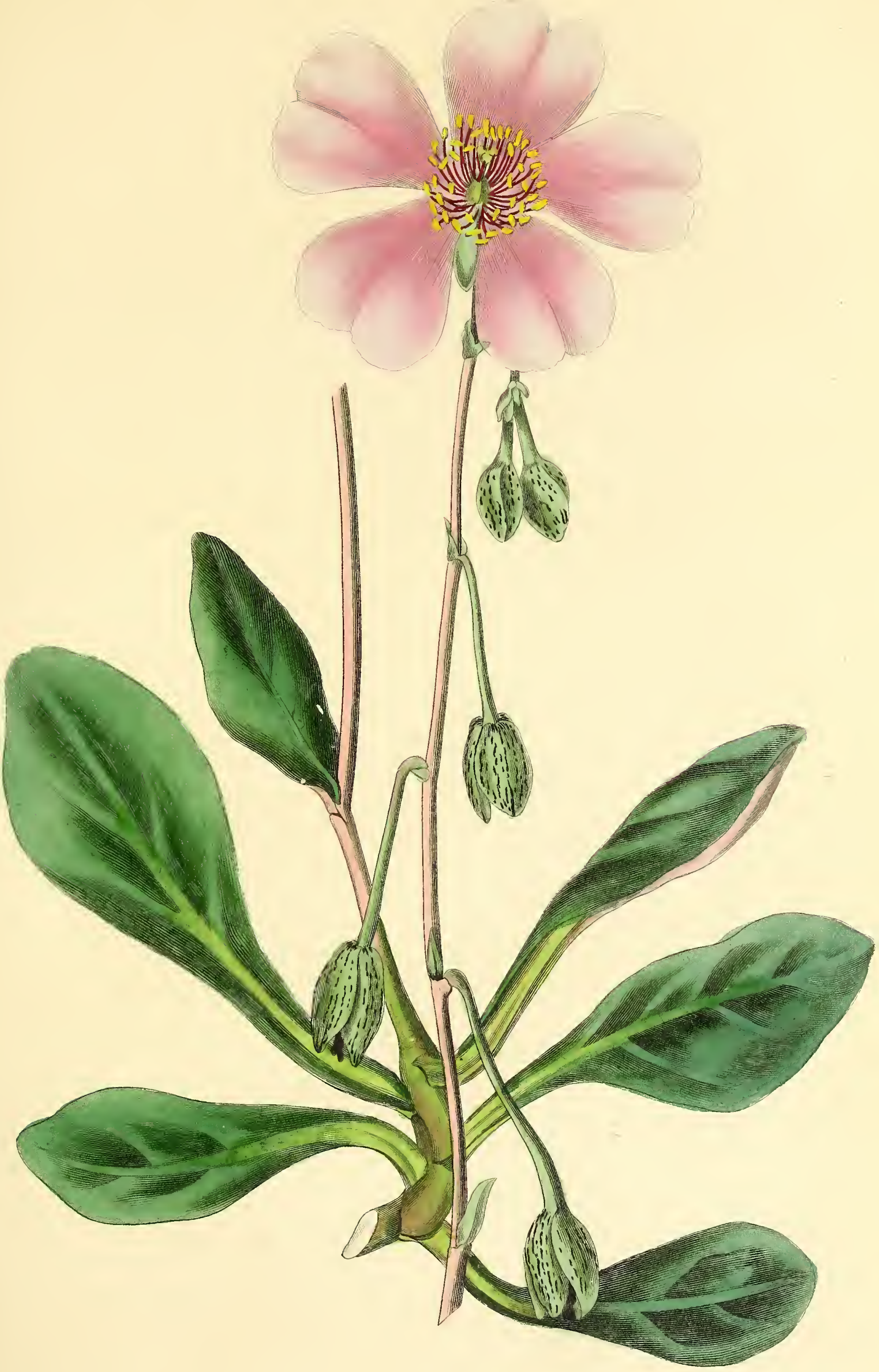
Specific Character,—*Stem* perennial, somewhat shrubby. *Leaves* fleshy, blue-green colour, spathulate. *Calyx* consisting of two nearly ovate, green leaves, spotted with black. *Corolla* five petals, expanding nearly two inches diameter, bright rose-colour.

Seeds of this beautiful plant were brought from Chili to the Horticultural Society of London, by Mr. M'Rae in 1826. The succulent leaves are of a bluish green colour, which beautifully contrasts with the bright rosy blossoms.

It is a perennial, and thrives well with us, both in the greenhouse and warm situations out of doors.

When planted in beds out of doors during summer, and well sheltered from the winds, they thrive exceedingly, but rarely live beyond the year, and are therefore treated as half hardy annuals.

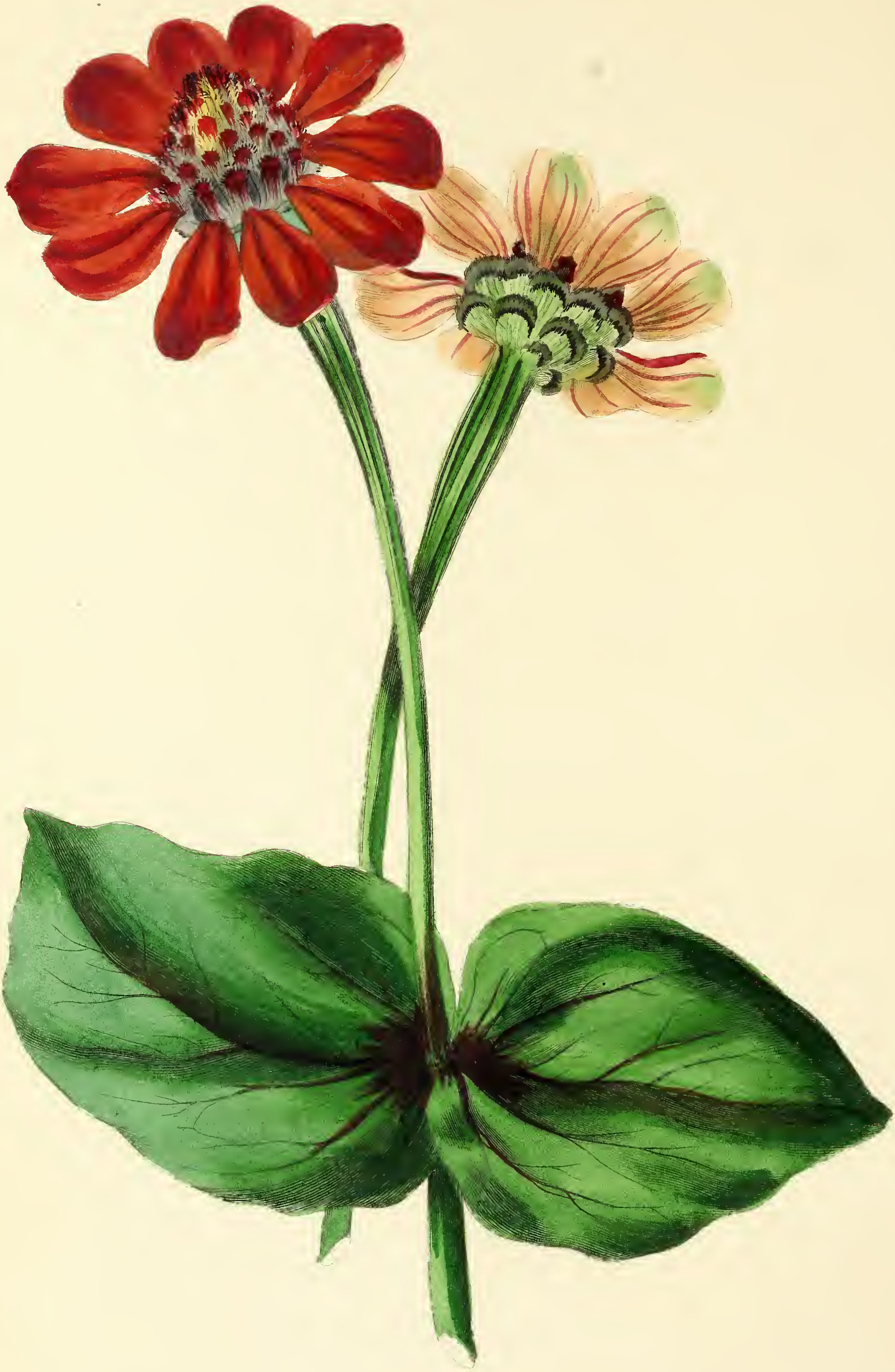
The reason of their death, at the end of the summer, is by receiving too much moisture. They will grow in any common light soil, and may be easily propagated by seeds and cuttings.



F.W. Smith. del et sculp.

Calandrina grandiflora.

Nov 1 1834



Zinnia violacea coccinea

1834

ZINNIA VIOLACEA COCCINEA.

(VIOLET COLOURED ZINNIA—SCARLET VARIETY.)

CLASS. SYNGENESIA.

ORDER. SUPERFLUA.

NATURAL ORDER. COMPOSITÆ.

GENERIC CHARACTER.—*Calyx* ovate, imbricate, cylindrical. *Receptacle* chaffy. *Pappus* awned. *Florets* of the ray 5 to 10, entire.

SPECIFIC CHARACTER.—*Plant* annual. *Stem* from 18 inches to 2 feet high, covered with bristle-like hairs. *Leaves* opposite, ovate, acute, clasping the stem. *Flowers* light purple.

VARIETY COCCINEA.—*Flowers* bright scarlet. *Ray* like the species. *Calyx* greenish yellow, imbricate. *Leaves* rich light green, opposite, clasping the stem. *Stem* growing 2 feet high, covered thickly with rigid bristle-like hairs. *Plant* annual.

SEEDS of this beautiful variety of Zinna were brought, amongst many other things, from Palermo, by His Grace the Duke of Devonshire. It far surpasses any other species or variety at present known.

All the plants of this genus are annuals, and are cultivated with the greatest ease, when treated as half hardy. The seeds require to be sown on a hot-bed in March, as recommended for other half hardy annuals (page 19), and by the end of May, or when the spring frosts are over, may be transplanted into the open borders, or placed in pots, at the option of the cultivator. The soil is a light rich loam.

GESNERIA COOPERI.

(MR. COOPER'S GESNERIA.)

CLASS.
DIDYNAMIA.

ORDER.
ANGIOSPERMIA.

NATURAL ORDER.
GESNERIÆ.

GENERIC CHARACTER.—*Calyx* cut into 5 parts. *Corolla* an irregular tube, bending inwards, and also backwards. *Limb* 2 lipped. *Capsule* 2 celled, inferior.

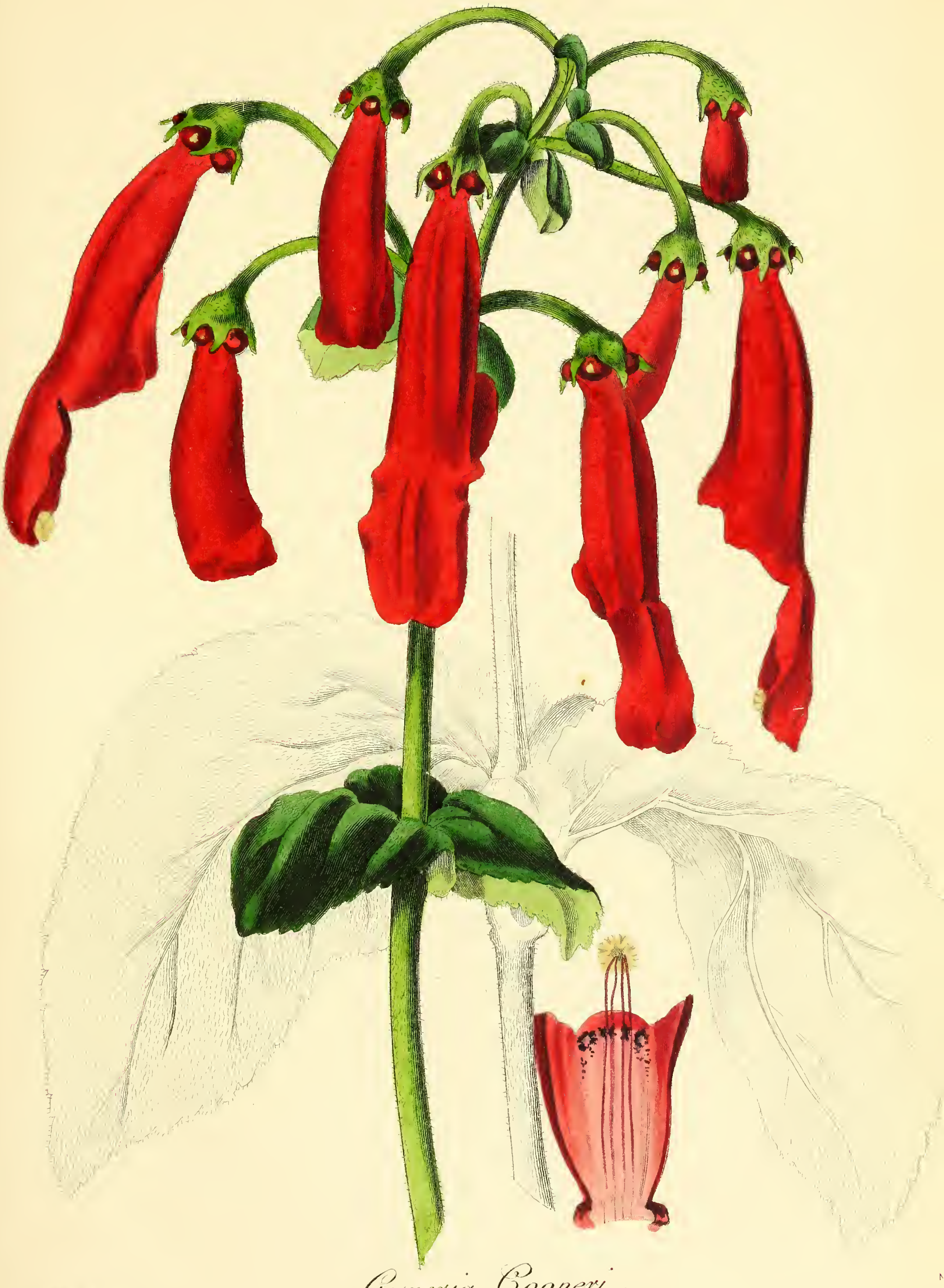
SPECIFIC CHARACTER.—*Herb* covered with soft downiness. *Leaves* opposite, heart shaped, dark green on the upper surface, and lighter beneath, thickly covered both on the upper and under surface with white downiness, notched and serrated; *leaf stalks* from 1½ inch to 2 inches long; *panicles* numerous; leaflets of the *calyx* short; *corolla* tubular, bright scarlet, soft, like velvet, slightly curved inwards, 3 inches or more long; *limb* one-third the length of the tube, upper lip much longer than the lower, slightly divided into 2 parts at the extremity, lower lip short, cut into 3 parts; *stamens* nearly equal in length to the corolla; *anthers* connected nearly into a square; *pollen* cream coloured; *germen* conical, villous, and longer than the segments of the calyx.

SYNONYM.—Gesneria bulbosa.—*Hook. Bot. Mag.* t. 3041.

THIS elegant species was sent to the late much to be lamented Mrs. Arnold Harrison, with other varieties, by her brother, from Brazil, about five years ago. It first flowered in the stove of Mrs. A. Harrison.

It is evidently the same plant as that figured by Dr. Hooker in the Botanical Magazine, 3041, under the name of Gesneria bulbosa, although the flowers in our specimen are deeper in colour, without the tinge of orange, and considerably larger. Subsequent observations of the plant repeatedly in flower has convinced us of its being so decidedly distinct from the bulbosa as to warrant us in naming it as a distinct species. We have therefore named it after our excellent friend Mr. Cooper, from whom we received the specimen for our drawing, and from whom we have since received plants; and under whose excellent management both the above and other species flourish in profusion at Wentworth.

The best soil for it is sandy loam and peat. It requires only the attention of other stove plants of a similar habit. It is easily propagated by cuttings, planted either in sand or mould, plunged in heat, and covered with a glass. It also produces seeds.



[illegible] sculp.

Gesneria Cooperi .

CULTURE OF THE BOUVARDIA TRIPHYLLA.

About the middle of April collect all the Bouvardias together, from the place where they have been kept through the dormant season: some amongst the orange tubs, others in cold frames, and others under the stage of the green-house.

Turn them all out of their pots, and shake the soil completely from the roots; thin off most of the large roots, yet retain as many of the fine fibrous ones as possible. Likewise at the same time cut down all the former years' shoots, retaining only two, three, or four eyes on each, according to the age or strength of the plant.

Plant them in pots suitable to the size of the plants, taking care never to overpot them, nor to cramp the roots by confinement.

When potted, water them to settle the earth about their roots, and place them in a cold frame, which is covered with hay and mats at night: keep the lights close during the night, and even in the day, unless the sun is very strong upon them, till they begin to grow; then give them portions of air, according to the day and their advance in growth. Subsequently leave the lights off through the day, and lastly do not put them on at night.

In about a week after they have been thus exposed, plant them finally out for the season, either in clumps by themselves, or distributed among other plants, when they are soon in fine bloom, and continue to flower till Christmas. By the autumn some of the year's shoots will have attained nearly a yard in length, and will be crowned with fine luxuriant clusters of splendid trumpet-like flowers.

As soon as frost is apprehended, take up the plants with balls of earth attached to their roots, disturbing the young growing fibres as little as possible, and place them carefully in pots that will admit of a little good mellow soil under the ball and around it.

When they are thus replaced in pots and watered, so as to settle the mould, those which are in luxuriant bloom mix amongst the green-house plants, when they will make a splendid appearance till January.

When the plants begin to shed their leaves, and the flowers are nearly gone, put them out of sight, as mentioned above, until April.

This treatment may be continued with the same plants for many years; for the application of fresh soil, the trimming of the old roots, the great luxuriance gained by growing without confinement of their roots in congenial soil in summer, renovate the plants, which could not be done by any other means of culture.

Bouvardias are propagated by cuttings of the roots, which are managed as follows: fill some large fruiting pine pots with good fresh mellow loam, well blended with either thoroughly rotten dung or vegetable mould.

Plant the roots all over the pot, beginning in a circle round the outside, opening the soil, and planting them with the finger, continuing to fill up one circle within another till it is finished in the centre of the pot or pots, leaving no more of the roots visible above the surface than just the top.

When planted, water and place them in a hot-house, where the temperature at night is kept between 60 and 70 degrees Fahr.

As soon as the shoots get to between four and five inches high, transfer the plants singly into pots of a small size, and by degrees harden them after they have been established.

When they have made some progress after this transplanting, plant them out into a bed four feet wide, eight inches between the rows, and four inches in the row: where, if the soil be good, many will soon be in flower. Pot them again before frost, and treat them as directed for the older plants.

The above excellent mode of cultivating this beautiful plant was first described by Mr. Mearns, gardener to his grace the Duke of Portland, Welbeck, Notts., in a letter to the London Horticultural Society, and in whose Transactions it was published, vol. vii., p. 501. The plan answers well, and deserves to be followed by all who grow this lovely plant: we have therefore given the details nearly in Mr. Mearns' own words.

If it is not convenient to take the plants up in autumn and pot them, they may be allowed to remain in the ground, for they will bear a considerable degree of frost; but it is best to cut them down in the winter for two reasons. First, because they are more readily defended from the severity of winter by litter or leaves; and, secondly, because a quantity of young shoots, which always produce the first flowers, are pushed out early in the spring, whereas if not cut down the shoots are weak and come out later.

CULTURE OF GARDENIA FLORIDA AND RADICANS.

Both these species are propagated by cuttings: the latter very easily, the former with more difficulty. The latter is a profuse flowerer; the former grows tall, and seldom continues in flower very long. The culture of both is on the whole similar, although in some things they differ.

1. *Propagation of G. florida.* In the beginning of April take off the tips of the young and half-ripened shoots, at about an inch and a half long, and prepare them for cuttings. This is done by taking off with a sharp knife a few leaves at the bottom of each cutting, and making a clear cut off, close under a joint.

2. When the cuttings are thus prepared, take some forty-eight sized pots and fill them half full of broken potsherds; over these potsherds lay a little moss, or loose

turfy soil, to keep the soil in which the cuttings are placed from being washed amongst the drainage. Then fill up the pot with a mixture of equal parts of sand and heath mould, well beaten up but not sifted.

3. Plant the cuttings about half an inch deep and an inch apart, placing the outer row close to the edge of the pot. Set them pretty fast, with a small dibber, and give them a gentle watering to settle the soil about them; then plunge the pots in a hot-bed frame, or other gentle heat, and shade and treat them as other cuttings.

4. When they have taken root, give them air for a few days previous to potting them off into single pots.

5. Pot them into sixty-sized pots, and be careful to give a good drainage. The best sort of soil to use for the first potting is composed of one-third peat, one-third turfy loam, and one third sand.

6. When potted, give them a little water, with a rose watering-pot; plunge them again in a hot-bed or tan-pit, and shade them for a few days until they have begun to grow; and by the end of June they will have become fine young plants.

7. About the beginning of July they will require repotting, and the greater part of them will be large enough to place in forty-eight-sized pots. The soil for this time of potting may differ somewhat from the last, by adding instead of the sand a little leaf mould.

8. When potted, again plunge them in a good brisk moist heat, and keep them shut close for a few days, and they will grow rapidly, and towards winter will show abundance of flower-buds; when they may be removed to the green-house, until it is wished to bring them into flower.

9. The best way of bringing them into flower is to place them in a close hot-bed frame, scarcely ever admitting any air, and occasionally syringing over the leaves with clear water, and watering the soil in the pots with diluted liquid sheep's manure.

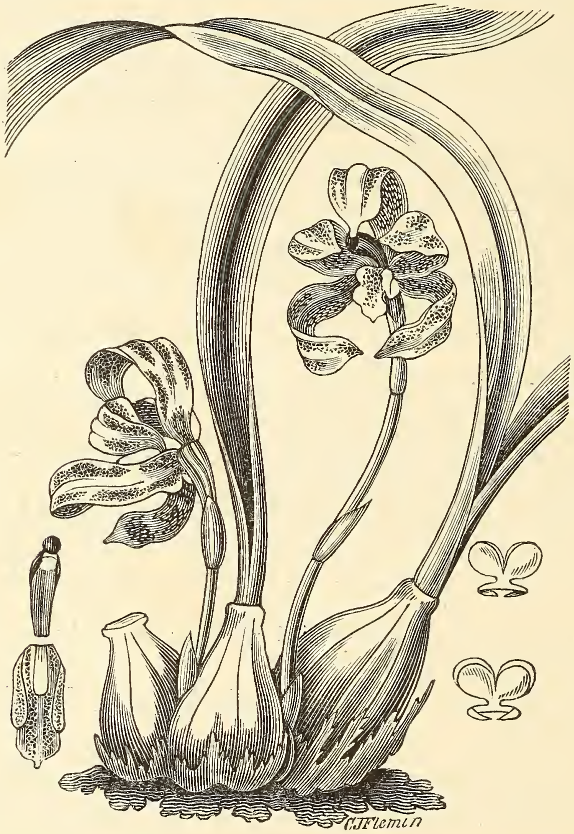
10. When the flowers become expanded, remove them to the green-house, where they will flower for some time.

11. The best time for potting is early in the spring, say from the beginning to the middle of March.

12. The *G. radicans* is propagated by cuttings in the same manner as the *florida,* but the best time to put them in is October; the same kind of soil suits them as the former, but they flower much sooner; for after they are struck and transplanted into sixty-sized pots, they flower the following spring.

CULTURE OF THE GENUS MAXILLARIA.

These plants, if any thing, are more beautiful than the Oncidiums; some of them are splendid. The *M. picta* (figure) is a charming plant; the petals of the flowers are of a rich deep orange colour, spotted with purple, within; and almost white, having spots and blotches of dark purple externally. The lip is of a pale dirty white or cream colour, with but few spots; and the column of a deep purple. This species is beautifully figured in the Botanical Magazine, from which work we copied our wood cut. The soil for these plants should be turfy peat, broken smaller than for the species of Oncidium, but by no means must it be sifted, or any fibrous roots which it may contain be taken out. Mix plenty of broken potsherds with the soil.

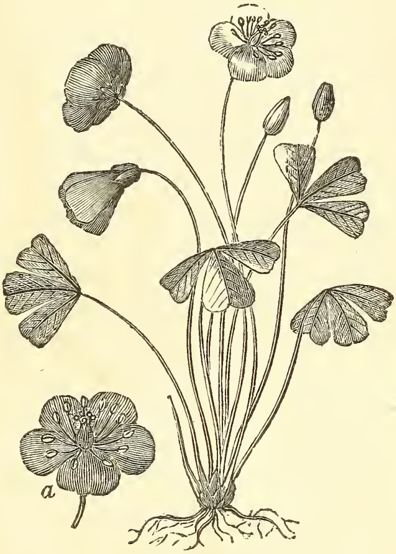


The temperature should range from 75 to 80 degrees Fahr., of fire heat. We are aware that most collections of Orchideæ are kept much warmer than this; but we have never perceived any beneficial effects produced by a very high temperature for Orchideæ in general.

CULTURE OF THE GENUS OXALIS.

The plants belonging to this genus are bulbous rooted, and of very easy culture; they are chiefly natives of the Cape of Good Hope, and therefore require the shelter of a greenhouse, but a few belong to the tropics, and consequently require the stove; and others are perfectly hardy. Many of them have been long inhabitants of our gardens, and are esteemed valuable plants.

The uses to which they are put are not numerous, yet they are some of them important. They also possess a peculiar acidity, in some species very grateful. That of the *O. acetosella* (figure) resembles the juice of lemons or the acid of tartar. The juice, when cleansed and evaporated, if set in a cold place crystallises. These crystalline salts are sold under the name of Essential Salts of Lemons, and are used to take iron moulds and stains of ink, &c., out of linen. Oxalic acid is also naturally formed in *Oxalis acetosella*, from which it takes its name.



O. crenata. The tubers of this species when cooked resemble potatoes in flavour, indeed they have been considered by some superior to that vegetable. When roasted they are stated to be very excellent; also the stalks used for tarts, like rhubarb, are very superior, and we have heard of the leaves being used for salad. We are unable to speak from experience respecting either the roots or leaves, never yet having had an opportunity of trying them, but we have tasted some tarts made of the stalks, which were very delicious, far superior we think to rhubarb, probably coming nearest in flavour to very fine apples. The flowers also are fine and showy, of a bright orange colour, but they all fall off without producing seed.

O. tetraphylla has also roots which are sometimes used as a substitute for potatoes. They are very easily cultivated, growing in almost any soil.

The leaves of several species are used for the same purposes as sorrel.

The culture of the different species may be stated as follows:—

1. *Hardy species.* These kinds require very little care. Plant the roots in a border somewhat shaded, and they will be sure to thrive and increase.

2. *Greenhouse species.* Many of these will endure a deal of cold, and require but a slight shelter in winter. They are chiefly natives of the Cape of Good Hope, and thrive in a mixture of about equal parts of sandy loam and peat.

The *O. crenata.* Tubers of this species should be planted singly in small pots early in April, and placed in a peach-house, or any other place where a moderate temperature is kept, until they have grown a little, and when all danger of frosts is over they should be planted in a light garden soil about three feet apart. When they have grown sufficient to admit of earth being added to their stems, it should be done as soon as possible, for the stems throw out roots into the ridge of earth, where the best, and not unfrequently the only tubers are produced.

O. floribundi. Any time from the middle of February until the beginning of March, the fleshy roots may be divided, taking care that each cutting of roots possesses a growing bud. Plant them in a flat pot or pan, filled with clear sand; after being planted, give them a little water, and place them in a stove or some other place where they will receive a brisk heat; give them the benefit of light and sun, and in a fortnight they will have grown considerably.

In potting, the best way is, to empty the soil out of the cutting pot, and take each plant carefully and place it in a sixty-sized pot, filled with equal parts of light rich loam and peat, with a small portion of sand. Give a small portion of water when potted, and give them a little heat and shade, until they have begun to grow. Towards the end of March remove them into a cooler situation, and gradually introduce them into a cooler temperature, until by the middle of May they will endure the open air, when they may be turned out into an open shady border.

O. Deppei succeeds well in a south border, and increases rapidly. All the leaves die in winter. It is best to take up the roots in October, pot them, and keep them nearly dry until the beginning of March, when they may be repotted and kept in the greenhouse till all danger of frosts is over, and then planted out in the open border.

O. Bowei will do very well in the open border in summer, but it does not blossom nearly so fine as when grown under glass. They should be potted in a mixture of light sandy loam and peat, and when repotted after the season of their torpidity, place them for a while in a stove or other place with a good heat, until they have begun to show their flower-buds, then gradually harden them until they will bear the open air.

None of the greenhouse species require water when the leaves decay until they begin to grow again, and lessening the supply of water should take place immediately after the plants have done flowering.

3. *The stove species*, as *Plumieris, fruticosa*, &c., will grow in the same kind of soil as that recommended for the greenhouse species. They require very little care and trouble, the bulbous kinds only requiring to receive every encouragement at the time of growth, and to be kept dry during the season of torpidity; and the shrubby kinds to be treated as other shrubby plants of a similar habit.

Propagation by Offsets. Separate the offsets from the bulbs at the time of potting, and treat them as recommended above.

By Seeds. Sow the seeds in March in pots or pans, filled with light sandy soil, and place them in a little heat. When they are up place them in an airy situation, give them a proper supply of water, and assist their growth by every means, and they will form good roots by the autumn, and at the time of the spring potting they may be taken up and planted in sixty-sized pots, and be treated like old plants.

By Cuttings of the Root. All the fibrous rooted kinds, as *repens, floribunda,* &c., are propagated by this means. See *O. floribunda,* as above.

Cuttings of the Stem. This is the way the shrubby kinds are propagated. They are planted in pots of sand or sandy peat early in spring, plunged in a gentle bottom heat, and covered with a glass. When struck, they are potted off into single pots, and treated like other tender stove plants.

Annual species. There is nothing peculiar in the treatment of these, the hardy kinds merely requiring to be sown in light soil, as other annuals, and the greenhouse kinds as half hardy annuals.

All admirers of this tribe of plants should possess *O. Deppei, Bowei, pulchella, crenata, Simsii, and floribunda.*

CULTURE OF THE GENUS PROTEA.

The difficulty of the culture of this genus of plants may be readily removed by attention to the following simple rules :—

1. Pot the plants in a soil composed of one half turfy loam, taken from the top spit of a pasture, and laid together till rotten, and one-fourth fine sand, and one-fourth peat; mix the whole well together, and break them fine, but by no means sift them.

2. Place them in pots proportioned to the size of the plants; they will not bear to be cramped, nor do they thrive when the roots have too much room.

3. Fill nearly one-third of each pot with broken potsherds, to prevent the soil from being sodden with wet; the roots also delight to grow in this rubble.

4. All this genus of plants suffer greatly if allowed to droop for want of water, the fibrous roots are of so tender and fleshy a nature that when they become dry and are allowed to remain so for any length of time they seldom recover.

5. These plants not only suffer seriously by drought, but they soon die if kept too moist; regularity in supplying water, as well as good drainage, is therefore indispensable.

6. Always allow them to stand where they will enjoy a free circulation of air, for if crowded they will soon suffer, if not die.

7. *Propagation.*—They are propagated by cuttings. Always select the wood

for this purpose when half ripe, for if become hard it rarely strikes, and if too young it is sure to damp off.

8. Make no cutting of less length than an inch and a half, always take them off at a joint, and cut the bottom quite smooth, and if properly managed afterwards, little fear need be entertained of their growing.

9. When prepared, plant them at least an inch apart, in pots filled with sand, and well drained. Place the pots together in the house, so that they can be covered with a hand-glass; by no means must they be plunged.

10. Take off the glass every day to allow all damp to dry up, or they will soon all perish.

11. Never water the cuttings over the leaves, but with a small pan teem it carefully into the pot, and never cover them with the glass until they have become partially dry.

12. Always plant the quickest rooting sorts together, and never plant indiscriminately the slow growing kinds and the quick growing kinds in the same pot; as, for instance, *cordata, amplexicaulis, nana, acaulis, grandiflora, mellifera,* &c. will strike within three months, or less in many cases, whilst the *magnifica, speciosa,* &c. &c. sometimes require more than double that period.

All the species are natives of the Cape of Good Hope, and require the protection of an airy green-house.

Whilst the plants are small, pot them in a soil composed of one half peat, one quarter sand, and one quarter turfy loam. Increase the quantity of loam at each potting, as the plants increase in size, until they are finally potted in the before-mentioned compost, Rule 1.

At all the pottings mix pieces of free-stone with the soil, as recommended by Mr. M'Nab for heaths, p. 240.

CULTURE OF THE GENUS ENKIANTHUS.

These are elegant little bushes, belonging to the Ericeæ, generally considered green-house plants, but they are more hardy than many of our plants requiring that shelter. They do not bear the cold of winter out of doors, but will do very well sheltered in a frame or pit.

The best soil for their growth is sandy loam and peat, and care is requisite not to over water them when not in a growing state.

They are propagated by cuttings, which strike without difficulty. The cuttings must be taken when the wood is ripened, and be planted in sand, under a hand glass, without heat.

CULTURE OF THE GENUS CLETHRA.

The *C. ferruginea, arborea, arborea minor,* and *arborea variegata*, are well adapted for the green-house or conservatory. They grow and flower well in a mixture of sandy loam and peat.

All the hardy kinds succeed best in peat, and may be planted on the American border, amongst the other plants.

The *C. tinifolia* is a stove plant, and should be potted in sandy loam. Both this and the green-house species are propagated by half ripened cuttings, planted in sand or sandy peat, and covered with a hand or bell glass; or they may be raised from seeds. All the hardy species require to be increased by layers.

CULTURE OF THE GENUS GRIFFINIA.

The species of this genus resemble those of amaryllis, but they possess stalks to their leaves, and bear blue flowers.

The *G. hyacinthina* and *parviflora* do well if potted in any rich mould, provided it be not very heavy; if it is, mix about one-third of white sand, and beat them well together, but do not sift them.

The *G. intermedia* requires a considerable portion of sand and peat mixing with the loam.

Set them in an airy part of the stove, and be careful not to give them any water when in a dormant state, but let them be well supplied when they begin to grow or show bloom.

They occasionally produce seeds, but are generally propagated by offsets.

CULTURE OF THE GENUS ONCIDIUM.

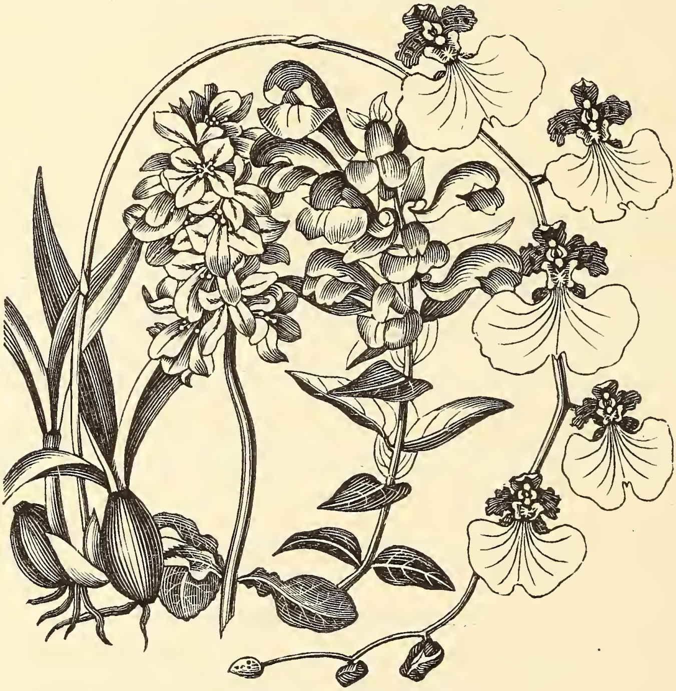
The species of this genus are curious, and beautiful stove plants. They should be potted in very turfy peat, not broken fine, but left in pieces as large as walnuts, and mixed with broken potsherds.

If thus potted water may be administered freely without injury, but if the soil be close the roots become injured, if not watered very carefully, and sometimes even with great care they will not thrive under those circumstances.

With regard to temperature, they seem to grow vigorously in a damp stove with other orchideous plants of similar habits. Messrs. Loddiges have observed that *O. bifolium* (fig. 1.) will not thrive in a pot, they therefore fix their plants to a piece of decayed wood, with the bark on, and a little moss fastened upon it. We have plants trying both ways, at Chatsworth, but experience has not yet taught us whether the potted one will thrive or not.

As the roots are often damaged at the time of shifting, we recommend large pots to be used, and let these be well drained with broken potsherds, as above.

The best time of potting is when they are not in a state of vigorous growth ; and they should always be allowed to become dry for some time previous to shifting. This applies to all the tribe with strong adhering roots. They all occasionally increase by offsets.



CULTURE OF THE GENUS FRANCOA.

This is a new genus, named after M. Franco, a botanist in Valencia, in the sixteenth century. Three species only are yet known, the *appendiculata*, *sonchifolia*, fig. 2., and *ramosa*. The flowers of the two first are of a light purple colour, marked with a dark velvet; those of the *ramosa* are nearly white. They are all natives of Chile, from whence they have been very lately introduced.

They may be readily cultivated in the open borders, being perfectly hardy. The soil in which they thrive is a rich light loam, or a mixture of loam and peat. They are propagated by division of the roots, and by seeds.

Divide the roots in March, and plant the divided parts, either in pots or in the open borders; and treat them the same as other herbaceous plants.

Sow the seeds about the end of February or beginning of March, in pans or pots, or on a slight hot bed. Allow the pots or pans to stand on a little heat till the plants are up. When they are large enough to be transplanted, either do it in small pots or on a bed of light soil, in a warm and sheltered situation, where they can be covered with a hand-glass. When sufficiently grown remove them to their proper situations in the borders, and treat them as the old plants.

CULTURE OF THE GENUS SCUTELLARIA.

All the species of this genus are herbaceous plants, and the greater part of them are hardy; only the *Havanensis* requires the stove, and the *humilis* and the *decumbens* the green-house. The prevailing colour of the flowers is blue, and in some of the species (as the *S. macrantha*, fig. 3, and several others) this colour is so brilliant as to render theplants very desirable in a collection.

All the hardy kinds are grown with little trouble in any light sandy loam; the green-house species will thrive in the open air during summer, but require the shelter of either a frame or green-house in winter. The stove species needs nothing further than the common care of other stove herbaceous plants.

They are all readily increased by division of the roots, and a few of them by seeds, which should be sown early in spring in pots, or on a warm border, and be covered with a hand-glass until the young plants are sufficiently strong to bear the weather.

CULTURE OF THE GENUS ERICA.

This genus requires peculiar treatment to ensure perfection of growth; but the species are not difficult to keep, provided proper soil be obtained, and the situation in which they are placed be suitable.

The free growing kinds appear to thrive best in good black peat, and large-sized pots; whilst the dwarf and hard-wooded sorts always succeed better in a very sandy peat and small pots, well drained with plenty of broken pots, and bits of turfy peat. They will not endure so much water as the free growing kinds, because they grow naturally in situations where there is little soil and less moisture.

Perhaps this may be better illustrated by naming a few species, with their localities; in doing which we will extract a short notice from the Gardener's Magazine, vol. 1, p. 364; in which place Mr. James Bowie, who went out as Botanical Collector for the Royal Gardens at Kew, names the situations in which he observed many of the species growing.

1. *Linnæoides, tubiflora, colorans.*—In running waters and springy grounds, a black vegetable soil.

2. *Albens, ampullacea, retorta, ardens, fastigiata, fascicularis.*—Shattered sandstone rocks, little or no soil, the roots embracing the stones in the crevices.

3. *Caffra, eriocephala, gelida, Halicacaba.*—Similar situations as No. 2, but thrive more freely in the moist clefts, 3,000 feet above the sea.

4. *Viscaria, Blærioides, viridiflora.*—Decomposed sand-stone, shaded by Scirpoideæ, &c.

5. *Sebana, sexfaria, Plunkentiana, baccans.*—Decomposed schistus, lower parts of the mountains and secondary hills, exposed to drought.

6. *Massoni, calycina, retorta, Walkeria, gracilis.*—In pure sand, exposed to heat and drought on the mountains, from 2,000 to 5,000 feet above the sea level.

7. *Mammosa, metulæflora, Cerinthoides, ignescens, grandiflora.*—In sand on the lower plains, frequently on spots abounding in natron.

8. *Vestita, filamentosa, cerinthoides, cruenta, versicolor, triflora.*—In loam, with iron pyrites on the exposed plains and secondary mountains, enduring drought at times for several months.

9. *Urceolaris, persoluta, arborescens.*—Decomposed schistus, on the streams in deep-shaded glens.

10. *Vestita, versicolor, discolor, hirta.*—In stiff loam, and margins of woodlands, moist glens, &c. surrounded by various *Pelargoniums, Scirpoideæ,* &c.

All Cape Heaths require a considerable portion of air, without which they are liable to be attacked with the mildew.

They are very impatient of being crowded together, and seldom prosper unless kept at a considerable distance from each other.

Fire heat is generally injurious, and should never be employed, except to prevent the plants from being injured by frost. The greater part of them might be kept through the winter in a common frame, if any plan could be adopted to ensure a dry atmosphere.

In shifting heaths, any time from March to August may be taken, as opportunity permits, or the state of the plants require.

Each plant should be raised a little higher in the pot at each shifting than it had been before, until the old ball about the stem of the plant is raised two or three inches above the level of the edge of the pot or tub. This system of high-potting, which in most cases is found of great advantage, was first introduced into use by Mr. M'Nab, of the Edinburgh Botanic Garden, an extract or two from whose excellent pamphlet, on the culture of heaths, we shall shortly give. The system of high-potting has since been adopted by Mr. Bow, of Lower Broughton, near Manchester, one of the best heath growers in this country, and in both the Liverpool and Manchester Botanic Gardens.

The plants are not very subject to be attacked by insects, but if troubled with the aphis or green fly, the usual system of smoking with tobacco should not be resorted to, for they are very impatient of smoke, and after being subjected to it several times, they not unfrequently die. The best growers make a practice of dipping the infected plants in some tobacco water, or if they be too large, syringe them with it, and afterwards syringe them with pure water. If attention be not paid to giving plenty of air they are liable to be attacked by the mildew. If this should be the case, it can only be remedied by keeping a dry atmosphere, and giving a very free circulation of air; also syringe the plants with a mixture of sulphur and water.

Propagation.—The stronger growing kinds should have cuttings made rather larger than the dwarf growers. It is the custom with many persons to place some of the latter plants in a hot-house for awhile, to draw the cuttings a sufficient length.

When the young shoots are a sufficient length, say about an inch long, take off the cuttings, and handle them delicately whilst trimming. Some persons cast the cuttings into a pan of water as they trim them, until a sufficient number is ready to fill a pot; others object to the system as highly injurious. The fact is, both are right; for some of the strong growing kinds, and a few of the hard-wooded dwarf kinds, are so far from receiving injury from the practice, that if not allowed to remain too long, they derive benefit; the water thus imbibed, preventing their flagging when planted in the pot. All those with delicate foliage, and of slender growth, also all whose foliage is covered with downiness to any extent, are injured, and not unfrequently destroyed by being thus saturated with moisture; these should therefore be laid in a cool damp place, as trimmed, until they are planted.

As regards filling the pots, this may be done either with finely sifted peat to within an inch and a half of the top, the remainder being a covering of white sand; but the best plan is to fill the whole pot with sand, on Mr. M'Nab's system, which appears to answer the best. For although with due care they may strike nearly equally well in both materials, yet when they are taken up for potting, the fibres are not so liable to be broken in sand as in peat.

Whatever the pots are filled with, they must have plenty of drainage; at least one fourth of the pot must be filled with broken potsherds.

The cuttings may be planted with a small dibber about the size of a quill, then being watered with a fine syringe, or rose watering pot, until the whole soil is saturated, place on a glass, and set the pot in the front of a green-house, and shade from the effects of the sun.

If the weather be fine, it is very likely the cuttings may require watering with a very fine rose watering-pot almost every morning during the first week or two, and afterwards twice or three times a week, until they begin to grow, which will be in five or six weeks; and in about nine or ten weeks they will be ready to pot off. If the weather is damp and cloudy, watering once or twice a week will be sufficient.

Some of the easy growing kinds may be planted under a hand-glass, on a north border, where they will grow very freely if kept from being injured by worms.

By seeds.—The seeds of Ericæ should be sown thinly in pots and boxes filled with fine sifted peat, as soon as possible after they are gathered.

When up, the young plants must not be overwatered; indeed, in damp weather, and winter, they should be kept rather dry than otherwise, which will obviate their liability to perish by mildew.

The system of Mr. M'Nab is as follows *. The best mode of propagating Cape heaths is by cuttings: the greater portion strike root freely when the young wood is taken, after it has become sufficiently firm to prevent its damping off.

The pots for their reception should be about nine or ten inches diameter at the mouths; fill them to within an inch and a half of the top, with broken pot or coarse ashes, the upper part of which should be of a smaller size than those below; over which should be placed a thin layer of fog (*Hypnum*), a moss so called, to prevent the sand from working down amongst the draining, then the remainder of the pot should be filled with fine sifted pit sand, as free as possible from earthy or irony matter, to the level of the edge, and the sand pressed down very firm; and, after being well watered, the pot is fit to receive the cuttings, the length of which must depend on the habit of the species.

Some of the free growing sorts may be about an inch and a half long; and others, that are of a more stunted growth, may not exceed half an inch: in both cases they should be taken from the plant at the part where the young cutting sets off from the older wood.

The leaves should be stripped off about half the length of the cutting, and the end should be cut clean with a sharp knife or scissors; the cutting is then fit to be inserted.

---

* This excellent mode of cultivating heaths, together with the general mode of treatment, is published in a pamphlet, at 2*s.* 6*d.*, which every lover of this beautiful tribe of plants ought to have in his possession.

Let the kinds selected for the same pot be as near of the same habit as can be judged; for instance, plant *E. melastoma, Petiveriana, Petiveria, Sebana, penicillata,* &c. in one pot, and *E. pinea, pinifolia, vestita, grandiflora, purpurea,* &c. in another pot; *E. ventricosa, prægnans, Linnæana, Linnæoides, colorans,* &c. in another; and *E. Aitoniana, jasminiflora, ampullacea, Irbyana, inflata,* &c. in another; for, unless this be attended to, one sort will strike root in a much shorter time than others in the same pot, which makes it very inconvenient when potting them out.

When the pot is filled with cuttings it should be well watered with a fine rose watering-pot, and placed in a close shady part of the stove, admitting as little air as possible, near to which the cutting pots are placed, taking care to water them every day.

Bell glasses are not necessary for heaths in general: some species, as *E. glauca, aurea, taxifolia,* and a few other species more difficult to strike, may be put under bell glasses, and placed in the stove beside the others.

Where no stove is at hand to put the cutting pots in, and where the situation in which they are to be placed has much air, then bell glasses are absolutely necessary.

The glasses will require to be wiped occasionally, to prevent any damp from injuring the cuttings; and when they have struck root the glasses should be removed gradually, some time before the cuttings are potted off.

Cuttings of heaths will strike root when put in at any season, if the cuttings are in a proper state; early in spring, however, is the best time for them.

When the cuttings are rooted they should be potted into the smallest sized pots, and kept for ten days or a fortnight in a close shaded place; then expose them gradually to a more airy part of the house, shading them from the sun till they are able to bear it.

The soil for the first potting should be one half peat and one half sand; drain the pots well with broken pots or cinders.

The second potting must depend on the season of the year: if the first potting be done in spring, the second should be as soon as the young roots appear round the insides of the pots; but if the first potting be done in summer, then the second will not be necessary till the following spring.

The soil of the second potting should be about two-thirds peat and one-third sand; and in all the pottings the soil should be a black peat, taken from a dry heath or common, which is never overflowed with water. In general, it should not be taken more than five or six inches deep; and where sand is not intermixed with the soil in its original state, about one-fifth of coarse white sand, free from irony matter, should be mixed with it.

In shifting heaths from one pot or tub to another, any time from March till August may be taken, as opportunity permits, or the state of the plants require. Before beginning to shift, prepare a quantity of the above soil, by riddling it through a very coarse riddle. If the plants are small, of course the riddle should be finer.

Either broken pots or cinders may be used for draining, whichever is most convenient: there is scarcely any danger of giving too much draining.

The plant should be raised a little higher in the pot at each shifting than it had been before, so that after two or three shiftings the old ball about the stem of the plant should be raised two or three inches above the level of the edge of the pot or tub, keeping sufficient depth between the old ball of earth and the edge of the pot or tub to hold water.

Besides the compost and draining, a quantity of coarse soft freestone, broken in pieces, of from one inch to four or five inches in diameter, is introduced amongst the fresh earth in the pot or tub, and pressed down amongst the soil round the ball. The quantity of the stone used to a large sized heath in shifting, would, if broken down to sand, and added to the sand previously to the soil, form about one-third of the whole mass. When stones are introduced among the earth in this way, heaths will never suffer so much in the summer from occasional neglect in watering them as they would do if the stones were not introduced, because these retain the moisture longer than the earth; and in winter they allow a more free circulation of any superabundant moisture which may be given through the mass.

Let as many of the best specimens and best kinds be kept within doors during summer as can, without having them crowded close together. One should not be allowed to touch the other when in the house in summer, and if the nearest part of one to the other is two or three inches apart so much the better.

The house should be well ventilated at all times; and, except in cases of high wind and heavy rain, both top and front lights should be open both night and day: and, besides watering the earth in the pots freely when they require it, they should be well watered over head with the garden engine every day, and if the weather is hot and dry this operation should be performed twice every day, namely, morning and evening.

In winter it is an excellent practice in dull weather, and even in frosty weather, if much damp is in the house, to throw in a little heat during the day: but this should never be done unless the weather is such that plenty of air can be given to the house at the same time; and the heat should always be stopped before the air be taken off.

Very little water should be given during frost, indeed none, except to those which seem to suffer from want of it; but in mild dry weather they should be watered freely with the watering-pot; and the engine should also be used once or twice a week, according to the state of the weather, that is, when it is dry and mild with much sunshine.

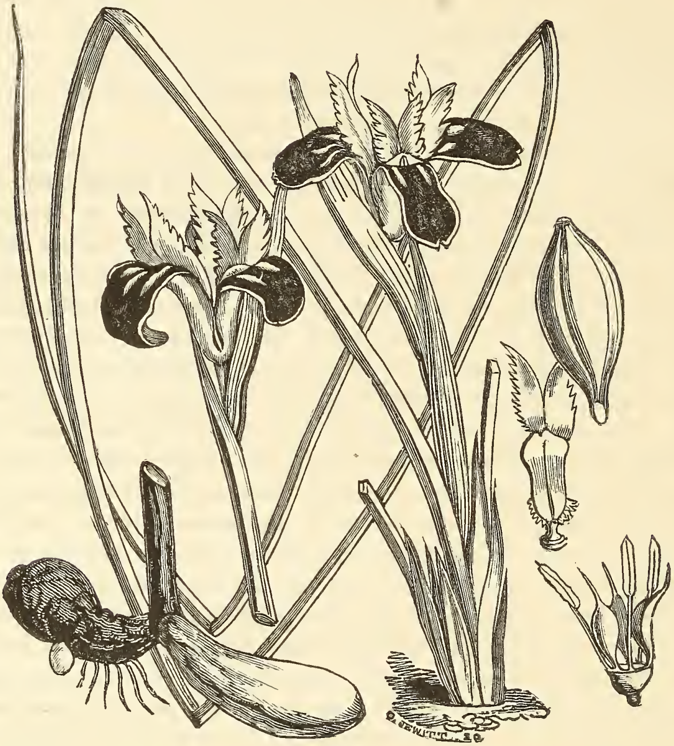
THE DOUBLE STOCK CAUSED BY DISEASE.

Plants are so far assimilated to the animal creation, as not only to be subject to diseases when over-stimulated with food, but the disease or deformity in the vegetable kingdom is carried on from generation to generation. So, in the human race, the hectic blush sometimes marks a whole family afflicted with pulmonary disease, though in others it settles only on one or two members of the family, and it sometimes passes one generation, and afflicts the next race. So, also, in disorders of the brain, the lurking malady passes from family to family, tainting one member in his own person, and another in his progeny, till the disease has destroyed the race, or is itself overcome by some happy accident of nature.

Now, the double-stock, having its seed-vessels and parts of fructification transformed into petals, either by a diseased seed, or excess of nourishment caused by rich earth, cannot perform its duty to nature by replenishing its species by seed. This beautiful though unnatural flower would therefore soon become extinct, were not florists careful in sowing the seeds of the single or natural flowers growing near those which have double blossoms. On examining a number of the double blossoms, we sometimes find a single anther concealed between the petals, the fecundating properties of which, although as infinitely small as pestilential particles in the air, are sufficient to carry disease to every pod of seed, the stigma of which it shall have passed over, either by the aid of the air or the accidental assistance of insects. Bees and other insects which live on the nectar of plants, seldom rest on flowers that have become so double as to exclude the parts of fructification, because there is no honey or nectar where there are neither anthers nor stigma. But if a single anther be growing in a double flower, the bees are sure to discover it, and thus they convey the pollen to more perfect plants; since nature, which is so perfect in all her works, has not inclined the bee to luxuriate indiscriminately from flower to flower of different generas, for then would the pollen of the melon be wasted on the stigma of a rose or of a poppy; but these industrious insects may be watched from blossom to blossom of every variety or species of a plant, without touching on one of a different family. Thus, one bee will be seen collecting from the natural order Cucurbitaceæ, whilst a second is rifling that of Rosaceæ, and others that of Labiatæ, &c.; and Jussieu himself is not better acquainted with the affinities of plants than are the bees and other insects which feed on the nectar of flowers.

CULTURE OF THE GENUS HERMODACTYLUS.

This genus is very nearly allied to the iris, and the species require very similar treatment to some of the species of that genus. A beautiful plate of the common snake's head is given in the Botanical Magazine, t. 531, under the name of *Iris tuberosa*, but now called the *H. bispathaceus*, and another species is figured in Sweet's British Flower Garden, t. 146, new series, called the *N. longifolius*, from which the present wood-cut was taken, which represents the plant half the natural size. See Horticultural Register, Vol. I., page 612, and Vol. II., page 300. The mode of culture is as follows:—



1. Plant the tubers in a soil composed of two parts turfy-peat, one part of white sand, and one part of completely rotted stable manure, all rubbed well together, but not sifted.

2. Plant the tubers six inches deep, and place a little of the finest soil about them at the time of planting, and so form the beds that the compost shall extend below the roots to at least nine inches deep.

3. As they are hardy they require no protection, except when in bloom, which happens so early in the season, that many flowers are destroyed by the spring frosts. It is, however, always necessary to plant the roots in an open situation.

4. The only time in which the roots can be removed with safety, is when they are in a quiescent state. The foliage begins to die down about the end of May, and continues to do so until the middle of June, when the roots may be dug up, and kept in sand in a moderately dry place for about a month, and afterwards planted, as before mentioned. If the plants be growing in pots they may, of course, be removed any time; but they do not thrive in pots for any length of time.

5. Care should be taken not to break off the digitals of the root in taking and planting, for if that happen the root will be prevented from flowering. Something

of this kind occurs when the roots are left undisturbed the whole summer; for, being fleshy, the worms and various insects are attracted to them, which gnaw and separate the digitals, if they do not destroy the roots. There would, however, be no chance of the plants living long in a cold adhesive soil where worms do not abound.

DRYOBALANOPS CAMPHORA.

Camphor is extracted from the *Laurus Camphora*, with the aid of heat; but the natural camphor, in substance and of the greatest value, is furnished by this tree. Some of the trees are six or seven feet in diameter, but it will produce camphor at a much earlier period when the tree does not exceed two or two feet and a half in diameter. The same tree which yields oil would have produced camphor, if unmolested: the former being supposed to be the first stage of the latter forming, and is consequently found in younger trees.

The natives have no certain means of ascertaining the tree which produces either the one or the other, although there are some men, styled Toongoo Nyr Cappoor, who pretend to that knowledge; but they cannot give any reason for their judgment beyond favourable dreams, which superstition has rendered infallible: but it must be admitted that this description of people succeed better than others who go in search of camphor.

Both oil and camphor are found in the heart of the tree, occupying a vacuum, which in others is frequently filled with pitch; but it does not extend to the whole length: on the contrary, they are found in small portions, of a foot and a foot and a half long, at certain distances.

The method of extracting the oil is merely by making a deep incision with a Malay axe in the tree, about eighteen inches from the ground, till near the heart, when a deeper incision is made, with a small aperture, and the oil, if any in the tree, gushes out and is received into bamboos, or any other utensil. In this manner a party proceeds through the woods, wounding the camphor trees till they attain their object. The camphor is pretty nearly obtained the same way.

The trees are cut to the heart about the same height from the ground as in the former instance, till the camphor is seen: hundreds may be thus mutilated before the sought-for tree is discovered. When attained, it is felled, and cut into junks of a fathom long, which are again split, and the camphor is found in the heart, occupying a space in circumference of the thickness of a man's arm. The produce of a middle-sized tree is about eleven pounds, and of a large one double that quantity. The camphor thus found is called Se Tantong.

It is often the case that the trees which have been thus cut, and left standing, produce camphor which is distinguished by the name of Oogar, but is inferior in appearance to the first, though of the same quality. The sorts of camphor called *belly and foot* are the scrapings of the wood which surrounds it. The camphor obtained from this tree is much more pure than that obtained from any other plant. —*Don's Mill. Gard. Dict.*

OPERATIONS IN NOVEMBER.

AMERICAN PLANTS in exposed situations, if the winds be very cutting, should have a few laurel branches stuck about them to protect them.

AURICULAS, be careful not to over water them; give plenty of air; and preserve them from injury by frost, p. 9.

AZALEAS, now brought into an increasing temperature, will continue in flower till February, p. 126, rules 5 and 6.

CAMELLIAS may be introduced into the vinery, &c. as they are wanted to bloom; care, however, must be taken not to give them a greater heat than 60 degrees by day, and something less by night, p. 34, rule 15.

CHRYSANTHEMUMS in pots will require abundance of air, to prevent the flowers from expanding weakly. See p. 187.

CALCEOLARIAS, cut down in July, will still be in flower. Continue to keep them in a cool, airy part of the green-house.

DAHLIAS will now require taking up; choose a dry, windy day for the purpose, shake off the soil carefully, so as not to twist the roots, and place them in an airy shed until perfectly dry, p. 104.

GREEN-HOUSE PLANTS must receive no water this month, unless when the soil in the pots becomes quite dry: be also careful during this month that none falls on the leaves, for if they become wet they will be liable to damp off. Give abundance of air whenever the weather will permit, p. 137.

FORCING.—About the end of the month Rhododendrons, pinks, &c. &c. may be introduced into a gradual heat.

MIGNONETTE, in pots, must be well sheltered from frost, and have very little water, which, when required, should always be given on a clear day, and in the morning.

HYACINTHS should be planted; see Calendar for October, also p. 41.

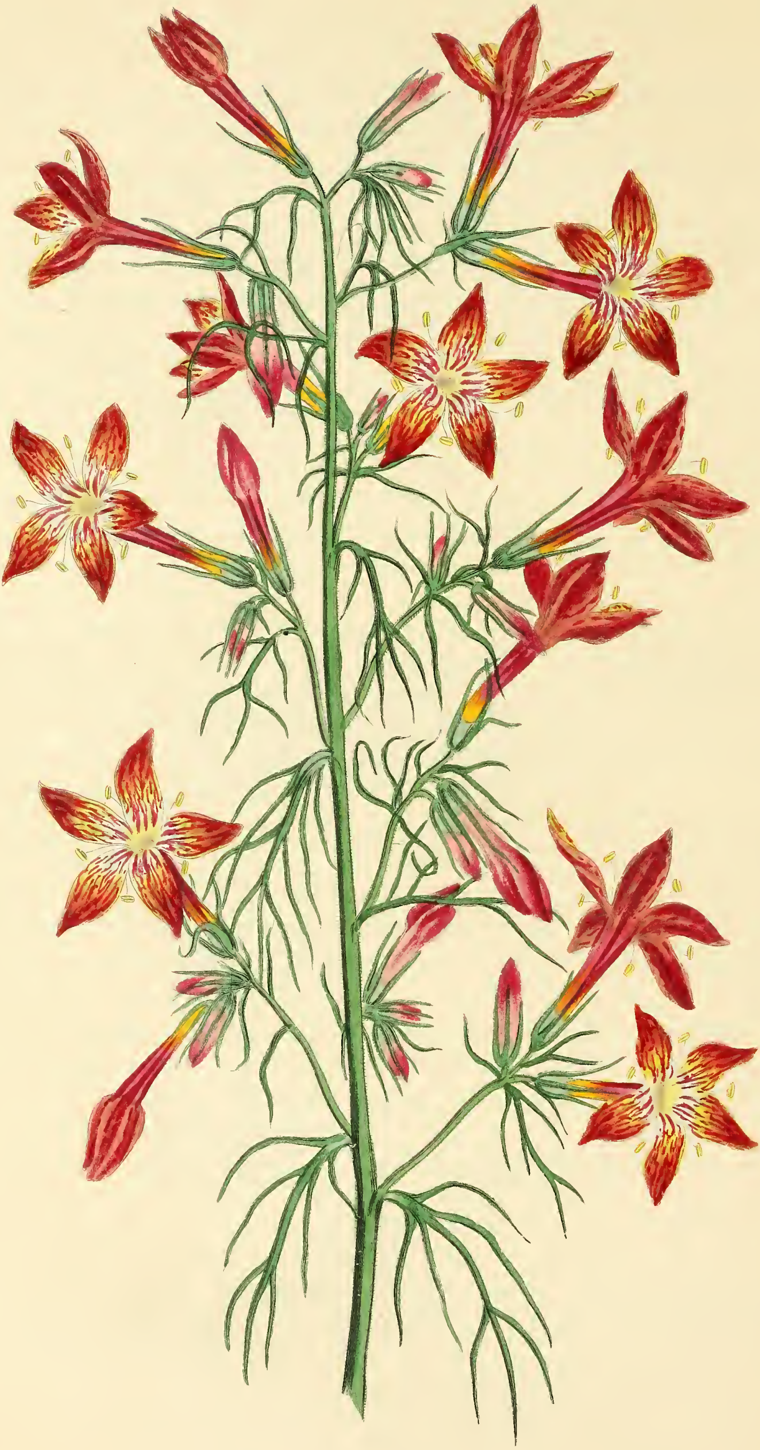
ROSES, in pots, now brought into the forcing-house, produce flowers in January, p. 144.

RANUNCULUSES, now planted in frames, will flower in March and April. Prepare beds for planting out of doors in March, p. 42.

TEN-WEEK STOCKS, sown in September, must have plenty of air and little water, and be well preserved from frost.

TULIPS may now be planted, and seed sown in pans or boxes, p. 61.

ERRATUM.—We are sorry that we were led into a mistake in calling the *Pæonia edulis Reevesiana*, figured in our last, a Moutan or Tree Peony; this is not the fact, as the plant is an herbaceous species or variety, and certainly a rare plant.



Ipomopsis picta

F.W. Smith del et sc

IPOMOPSIS PICTA.

(PAINTED-FLOWERED IPOMOPSIS.)

CLASS.	ORDER.
PENTANDRIA.	MONOGYNIA.

NATURAL ORDER.
POLEMONIACEÆ.

GENERIC CHARACTER.—See page 27.

SPECIFIC CHARACTER.—*Stem* erect, covered with fine downy hairiness. *Leaves* with very narrow divisions ending in a fine point, covered with downiness. *Flowers* growing in clustered panicles. *Corolla* funnel-shaped, rich carmine colour on the outside, tube narrow, limb five-cleft, segments terminating in a point, orange red, spotted with carmine, mouth of the tube nearly white.

SYNONYMS.—Gilia coronopifolia. *Lindl. Bot. Reg.* 1691.

IPOMOPSIS ELEGANS.—*Smith's Exotic Botany.*

THIS beautiful species is a native of Carolina, from whence it was introduced so long since as 1726. It greatly resembles the *Ipomopsis Elegans* given p. 27, both in its delicate slender habit, and carmine coloured flowers, but it may be easily distinguished from the *elegans* by the narrow divisions of the leaves, and by the flowers being somewhat larger.

This plant is also much easier to cultivate than the *elegans,* requiring comparatively little trouble. If the seeds be sown in the autumn as recommended p. 27, and the plants be treated as hardy green-house plants, they will flower the following summer with the greatest freedom, and produce abundance of seeds.

The plants from which our drawing was taken flowered in August last, in the green-house at Chatsworth, and where both this and many other plants of the same species still continue (Oct. 22) to be a perfect picture of flowers.

CALCEOLARIA BICOLOR.

(TWO-COLOURED SLIPPERWORT.)

CLASS.
DIANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
SCROPHULARINEÆ.

GENERIC CHARACTER.—*Calyx*, four-cleft; *Corolla*, monopetalous, two-lipped, inflated. *Capsule* two-celled and four-valved.

SPECIFIC CHARACTER.—*Stem*, erect, shrubby, from one to two feet high, branching, hairy. *Leaves*, opposite, obcordate, coarsely serrated, covered with soft downiness. *Flowers* cymose, two-coloured. *Calyx* yellowish green, downy. *Corolla*, upper lip very short, bright yellow, lower one large, inflated, entire, from the base to the middle, white, and the remainder bright yellow. *Stamens*, two. *Anthers*, orange. *Ovarium*, conical.

THIS showy plant is a native of Canta in Peru, where it was discovered by Mr. Cruckshank, who introduced it in 1829.

It is a hardy green-house plant, and flowers very freely in the open air during summer, but requires to be taken up and sheltered in the green-house during winter. Light rich loam is the most suitable soil for it.

The plant is propagated freely by cuttings of half ripened wood planted in small pots, and plunged in a little heat. Also by seeds, which are occasionally produced in abundance.

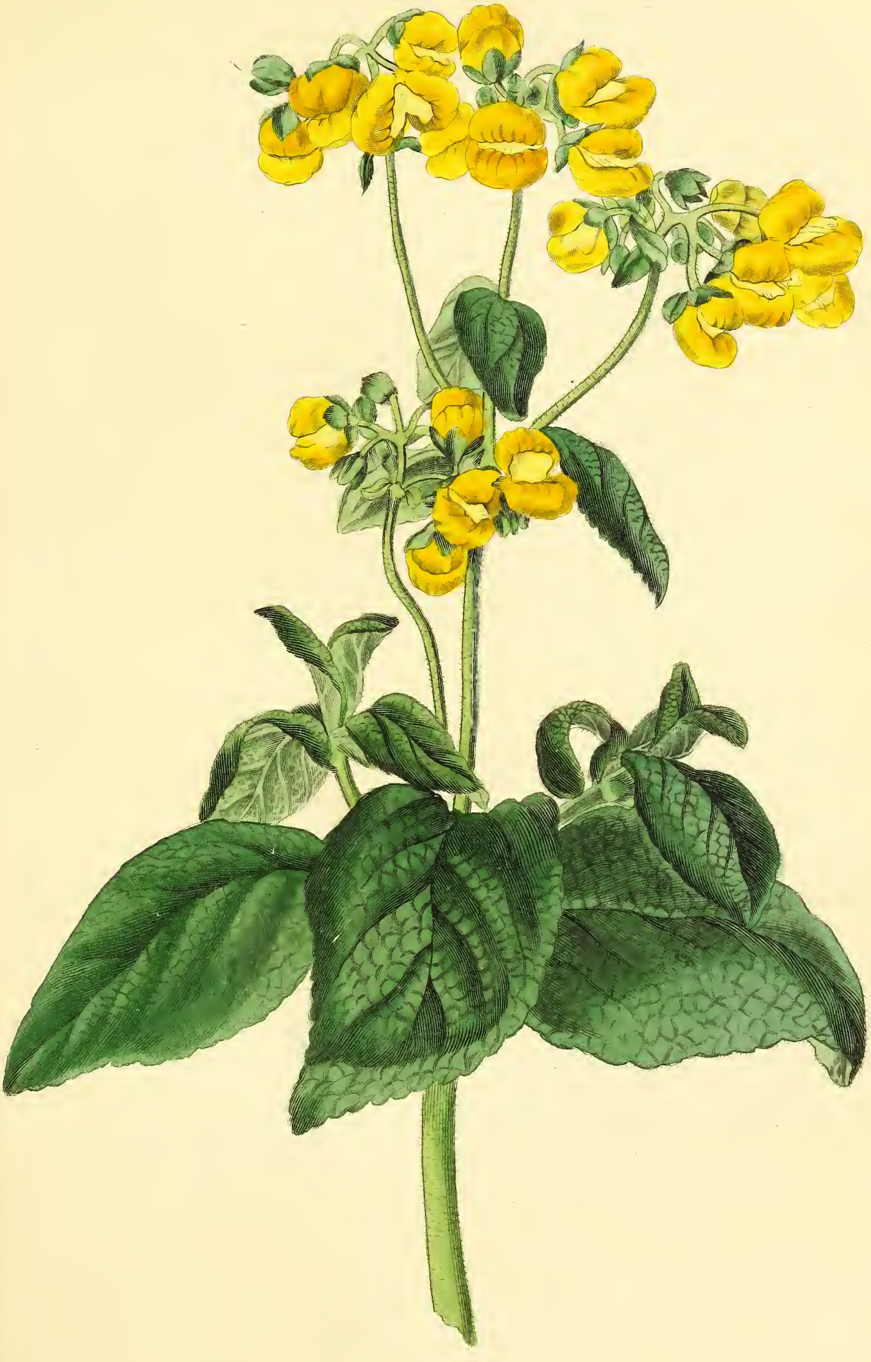
Our drawing was taken in July from a plant flowering in the green-house at Chatsworth.

Calceolarias, particularly the perennial herbaceous species, are now become very numerous, and in general are so beautiful, that they deserve a considerable share of attention. They are well calculated to give a great degree of interest to the flower-borders during the summer months, and by judicious management, the greater part may be made to contribute not a little to the decoration of the green-house, during October and November.

There are now upwards of forty sorts cultivated in our gardens, and there is little doubt but that every year, many new varieties will be added to this already numerous genus, and in a few years, as Mr. Sweet observes, the species and varieties will become as numerous as the extensive family of geraniums, and be equally easy of culture.

Probably all the British hybrids will stand well in a cold frame, or in any situation protected from heavy autumnal rains and intense frost.

When planted in light soil, most if not all of them will live through the winter, having no other protection than an inverted flower pot, full of dry litter, standing



Calceolaria viscosiſsima

Smith del et s.

over them. These will never flower, however, so early or so elegantly as when they have had a good winter protection.

The *C. Youngii* may be grown to the height of three feet or more, having from 150 to 200 flowers in perfection at one time, and in this state it is a most enchanting object.

All the annual species and varieties as *C. pinnata,* &c., should be sown on a hot-bed at the same time and in the same manner as other tender annuals (p. 21) and when they have grown a sufficient size, transplant them into single pots, and place them amongst the other green-house annuals, or place them in warm situations out of doors, where if the weather be fine they will flower very well.

The biennial species and varieties as *C. floribunda,* &c., should be sown in September, and be treated like other green-house biennials (see p. 66), and they will flower the following summer.

The perennial herbaceous species as *C. Youngii, Gellaniana,* &c., are easily propagated by division of the roots, and in many cases by cuttings and seeds.

The shrubby species as *C. Morrisoni, angustiflora,* &c., are raised by cuttings of half ripened wood, and by seeds.

Plant the cuttings in light sandy soil; either in pots which may be plunged in a little heat, or in a little bed under a hand-glass, and they will root without difficulty.

If the seeds of either the biennial, herbaceous or shrubby kinds be sown as soon as gathered, they produce plants which flower the following summer. But they are not so strong as those raised in the spring, which are not allowed to flower till the year following.

When they are of a sufficient size, transplant them singly into small pots, keeping them in the green-house. Repot when necessary, so that by the end of the year, the plants will be very fine, fit for blooming strong the following year, and standing in 48 sized pots.

As soon as the roots push through the holes at the bottoms of the pots, place them in pots a size larger, being careful not to disturb the roots more than can be avoided. In a month, the roots will again make their appearance, repot them again as before.

About the beginning of March, the roots will again have progressed, the plants may then be placed in large pots, the size called half-gallons or twelves.

Particular attention should now be paid to air and water; always keeping the soil just moist, but never allowing it to be saturated, which must be considered a rule at all times.

At the end of April or beginning of May, remove the plants from the green-house to a cold frame, for ten days or a fortnight, to harden them gradually, previous to being placed in the situations where they are intended to bloom.

If they are to flower in pots, the size used are what are called peck pots, and these should be well drained with potsherds according to the hardness of the pots, and afterwards filled with the following compost.

Two parts fully decomposed stable manure, one part of leaf or vegetable mould, and one part of fine white sand, or in the absence of that, one part of sandy peat. Mix these well together, and beat the compost fine, rubbing it through the hands to break the lumps ; for this process will answer much better than sifting.

This compost is suitable for *C. Youngii, farinosa, fuscata, picta, Atkinsoni, picta pallida,* and *Morrisoni.*

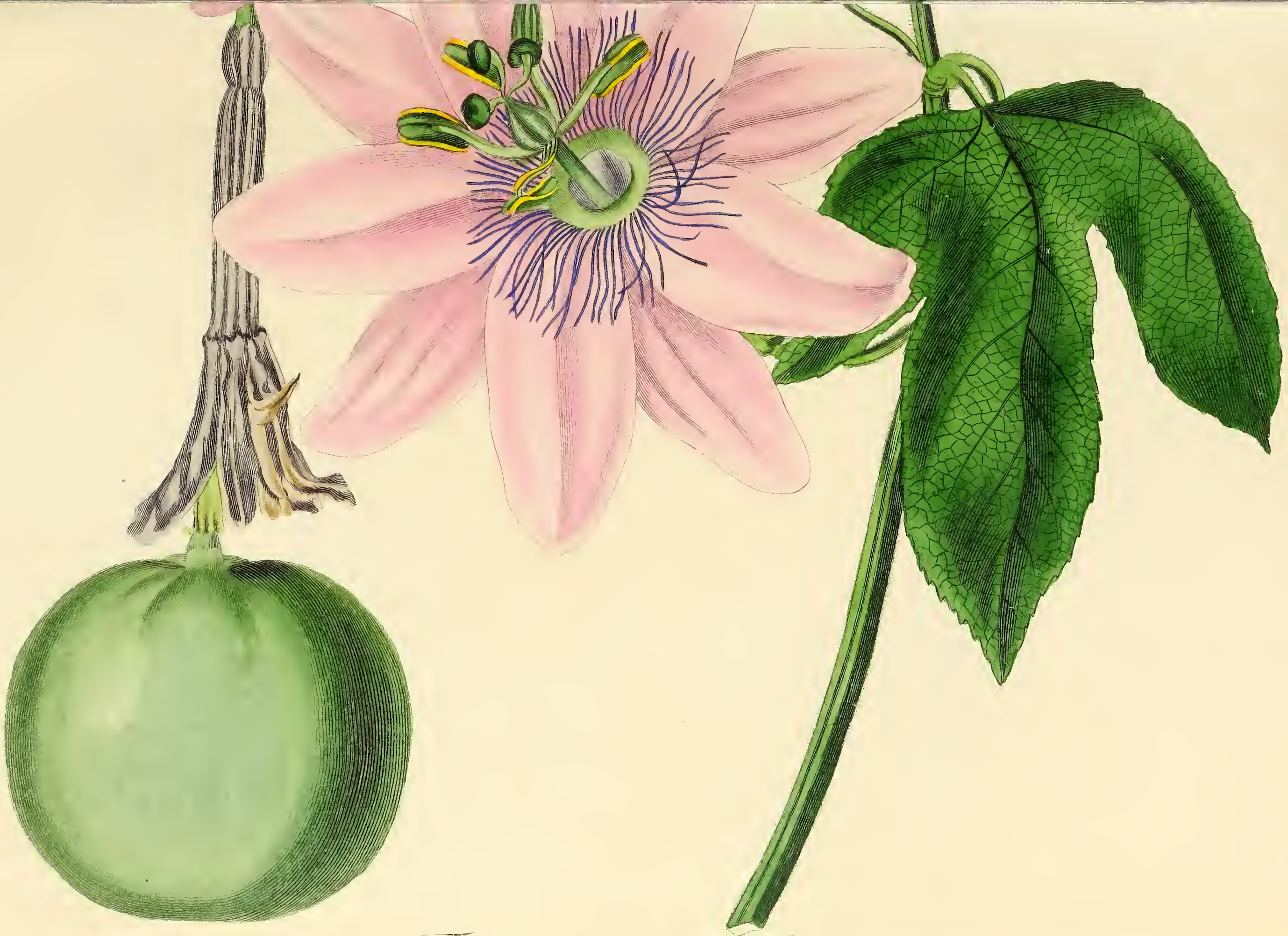
The *C. polyantha,* is one of the most interesting of the yellow flowering species ; the individual flowers are not so large as those of some others, but the very elegant habit of the plant, and the profusion of flowers it bears, render it very striking.

The *C. polyantha, Wheeleri, atrosanguinea, Hopeana, Youngii pallida, Epsomiensis, monstrosa, pulchella,* white and crimson, ochre and crimson, and cream and crimson, delight in a compost something different from that recommended for *C. Youngii,* &c. Instead of any vegetable mould, add to the dung and sand, one fourth part turfy loam, as free as possible from oxide of iron.

To have any fine sorts in flower late in the autumn, nothing more is necessary, than, as soon as the terminal flowers of the principal racemes are got to the full size, to cut the entire branches down to within an inch of the surface. Then take off about an inch of soil, and replace with fresh compost *sifted ;* this will in general happen about the end of July.

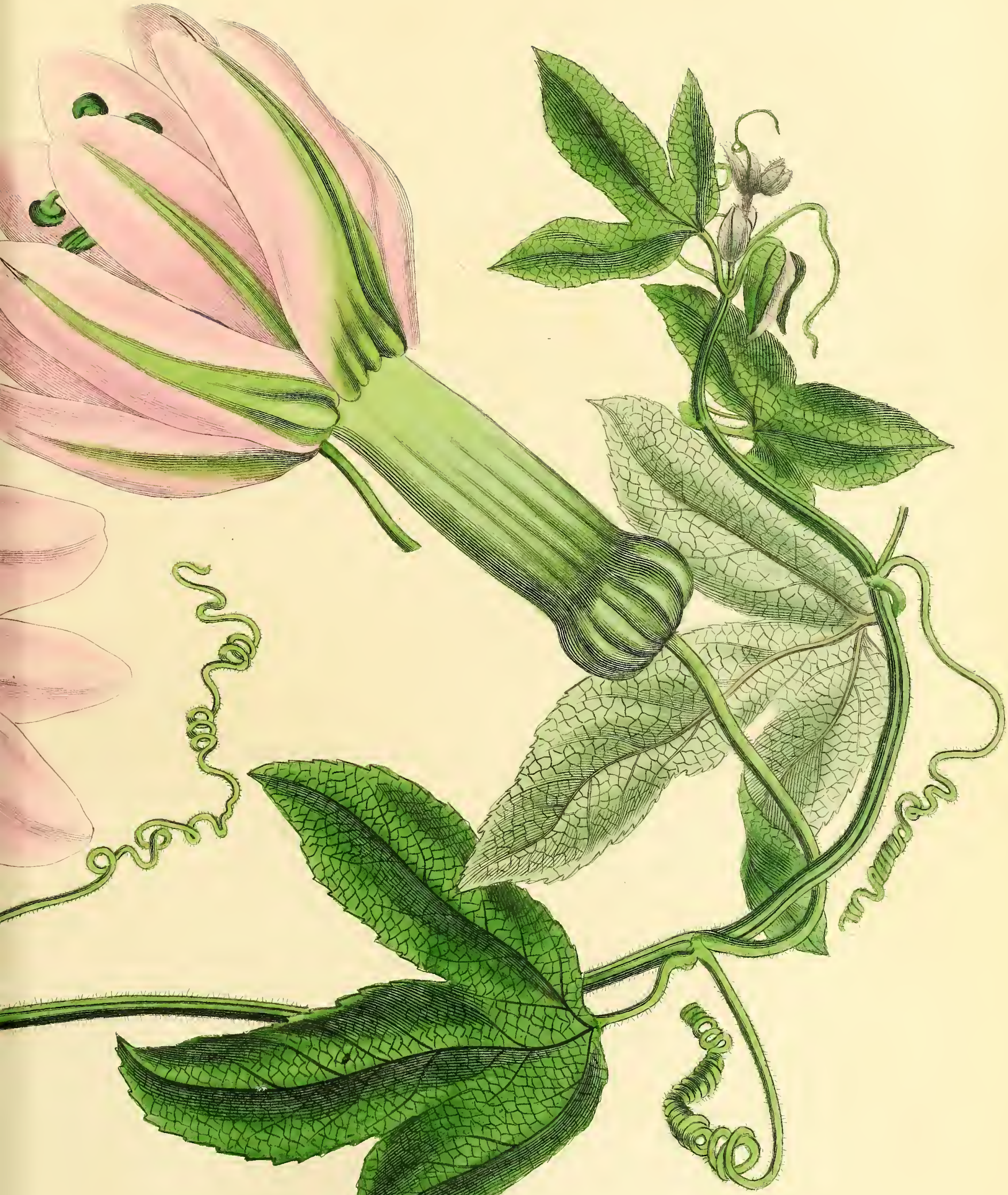
When this is done, place the plants in a cold frame, where they can be sheltered from rains by a covering, and in about a month they will be fine vigorous plants, producing plenty of flower-stems, which will flower in the green-house during October and November.

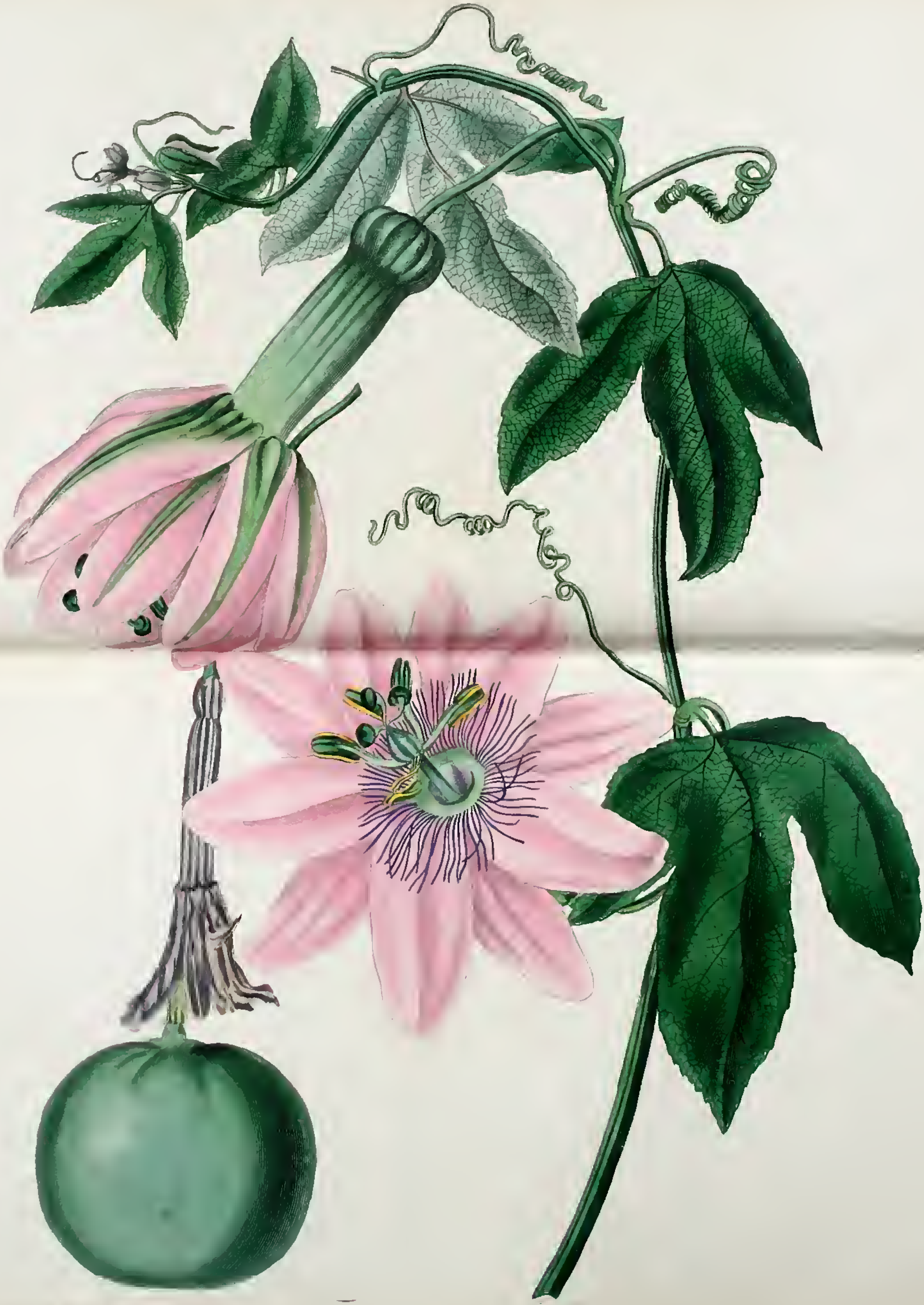
The sorts best calculated for the second blooming are, *C. Youngii, polyantha, Youngii pallida, picta, picta pallida,* white and crimson, cream and crimson, ochre and crimson, *Wheeleri, farinosa, monstrosa, Atkinsoni,* and *atrosanguinea.*



[illegible] sc.

Tacsonia pinnatistipula





Tacsonia pinnatistipula

TACSONIA PINNATISTIPULA.

(PINNATED STIPULED TACSONIA.)

CLASS.
MONADELPHIA.

ORDER.
PENTANDRIA.

NATURAL ORDER.
PASSIFLOREÆ.

GENERIC CHARACTER. *Involucrum* three-parted. *Perianthemum* coloured, consisting of ten leaves. *Stamina* fine, united in a long tube.

SPECIFIC CHARACTER. *Stem* twining, covered with woolly hairiness, four-sided. *Leaves* smooth and glossy on the upper side, woolly on the under, three lobed, and serrated. *Leaf-stalks* half an inch long. *Flower-stalks* solitary, from two and a half to three inches long, usually twisted. *Tube* of the flower two inches long, of a yellow green colour outside, white within. *Outer segments* of the perianthemum pale green, tinged with a light rose colour. *Inner segments* of a brighter rose colour, delicate. *Crown* purple. *Fruit* nearly globular, bright yellow when ripe.

THIS elegant passion-flower is a native of Chile and Peru, whence seeds were procured in 1829 by Mrs. Marryat, of Wimbledon, in whose conservatory the original plants flourish and flower in profusion, and to whose kindness we are indebted for our figure, which was made from a branch separated from one of the original plants.

It grows freely in the same kind of soil as the strong-growing species of passifloræ, namely, in a mixture of rich loam and peat. It is nearly hardy, and requires an airy open situation in the house.

Cuttings of the previous year's wood, planted in pots filled with sand or sandy loam, well drained, and plunged in a little heat, will strike root easily. It also bears seeds, which should be sown as soon as they are separated from the fruit.

CULTURE OF THE OLIVE TREE.

About 20 different kinds of olive are known in this country at the present day; some of which are esteemed for their fragrance, as *Olea fragrans, &c.*, and others for their fruit, as *O. europæa,* (figure) and its varieties.

This last named species has been known, and cultivated for many ages, and from very ancient custom the Olive branch has been used as an emblem of peace. It is a native of the South of Europe and the North of Africa, where it is very generally and extensively cultivated.

It is supposed to have been carried from Egypt into Attica, about 1556, before the Christian Æra. It was first planted in Italy in the thirteenth year of the reign of Servius Tullius, the sixth king of Rome. The Romans appear to have paid great attention to its culture, and considered it next in value to the vine.

According to the best authenticated accounts, the olive was introduced into England in 1570; and although it has been so long an inhabitant of this country, it is cultivated in but few places, and in these few it is generally grown in the green-house as an ornamental plant, for although in its native country this plant is extensively cultivated for the sake of the oil extracted from the berries, yet the variableness of our climate renders the probability of crops of the fruit very precarious out of doors, and they are not of sufficient value to grow extensively under glass.

The oil of olives is contained in the pulp only, and not in the nut or kernel as in most other fruits. It is obtained by simple pressure. The olives are first bruised by a millstone, and then put into bags, all the liquor is then pressed out by means of a press.

The bags are either made of linen, hemp or rushes, and occasionally woollen ones are used, but as these are apt to soon become dirty and rancid, they are not in much repute; linen or rushes are reckoned the best.

Oil is the main support of commerce in some provinces in Italy. The quantity imported into Britain in the course of a year is upwards of 2,000,000 gallons, the duty of which amounts to about £75,000. The most valuable is imported from the South of France.

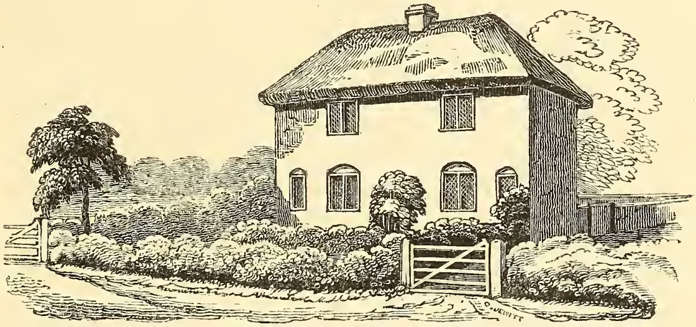
Besides the extraction of oil, olives are used for pickling and preserving; and Gerard in his "Historie of Plants" enumerates many excellent medicinal properties which they possess. It is stated that two glass jars of olives, and olive oil, have been dug out of the ruins of Pompeii, both of which were fit for use.

The olive is readily propagated by seeds, buds, cuttings, grafts and knots. Indeed every part of the tree whether root, branch, or trunk, may be turned into plants by separation. Cuttings, however, generally bear fruit soonest, although plants raised from seeds, become much finer and stronger plants. The cuttings strike very readily if planted in light sandy soil, or sand itself, plunged in a little heat and be covered with a bell or hand-glass.

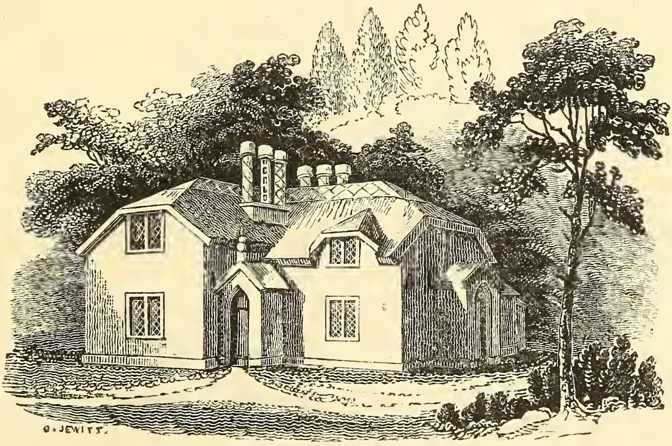
The stove species as *O. cernua, &c.*, require the common treatment as other stove plants, and the green-house species, as *O. fragrans,* &c., as other green-house plants.

DESIGNS FOR THE ERECTION OF ORNAMENTAL COTTAGES, ON GENTLEMEN'S ESTATES.

In all extensive estates the beauty of the prospects is greatly augmented by the erection of neat ornamental cottages in suitable situations; which, besides the beauty of their appearance, furnish comfortable habitations for the labouring classes. The wood cut represents one of a number of double cottages, built by Sir E. F. Broomhead, Bart., at Thurlby, a small village on the road from Newark to Lincoln.

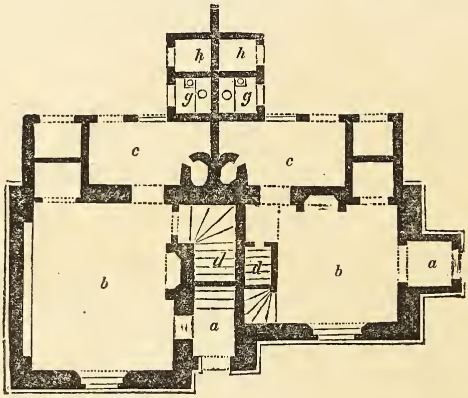


Each of these cottages contains two dwellings. In front, betwixt it and the road, (from which it is separated by a green hedge and a deep ditch), is a garden belonging to both, and only divided by a walk down the middle. Behind is an entire yard to each house, fitted up with a pigsty, and every other convenience. The entrance to each dwelling is from its own yard, and a road is left closed with a gate, at each end of the garden, by which the yard is entered, and coals and other articles brought in.



The erection of cottages of so plain an aspect may not suit the fancy of some landed proprietors. To such the design No. 2 will be more novel and picturesque. This design is for two dwellings united; this being much preferable to single houses, by the advantage of a near neighbour in case of sickness, &c.

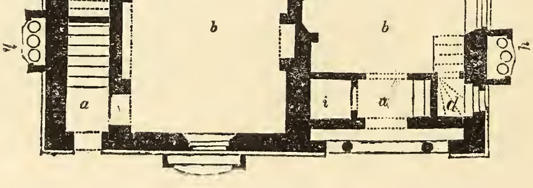
One of the houses is a little larger than the other, and is intended for a man and wife with a family, when a bed may be placed in the recess in the kitchen; and if the family were large, a bed might be put up in the large closet under the stairs. The other house is intended for a man and his wife without a family.



In each house *a* is the entrance; *b*, the kitchen; *c*, washhouse; *d*, closet under stairs; *g*, privy; *h*, pigsty; bed rooms above; *i*, situation for bee hives.

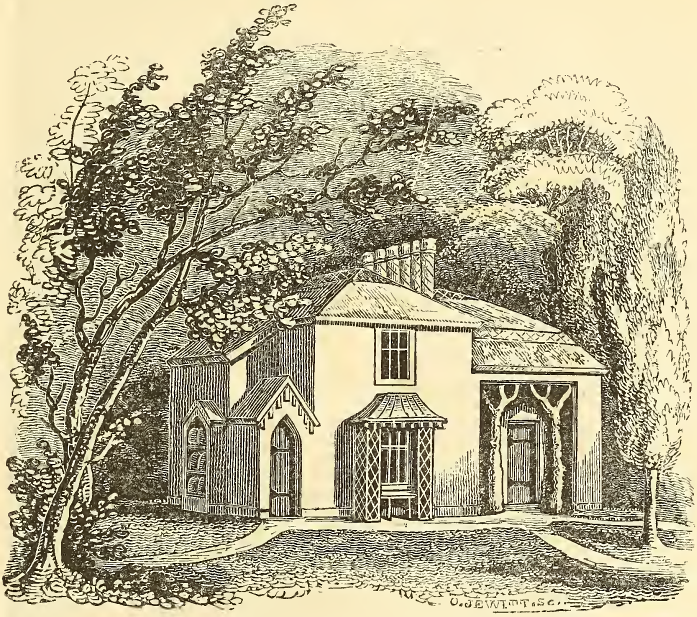
This house may be built of stone, or brick plastered outside, having a straw roof; the wash-houses, &c. are lean-to's; the chimney stalks may be ornamented with plaster or cement; the windows may have wooden mullions, painted like stone. The windows may be made to turn round on a pivot and socket at the centre.

This cottage is adapted for almost any situation; but every dwelling ought to be raised a little above the grounds which surround it, and well drained underneath.



This third design also consists of two houses united for the reasons before given. In each house *a* is the entrance; *b*, kitchen; *c*, wash-house; *d*, closet under stairs; *e*, coal or wood-house; *f*, pigsty; *g*, privy; *h*, stand for bee hives; *i*, in the smaller house, pantry. The wash-houses, &c., are lean-to's.

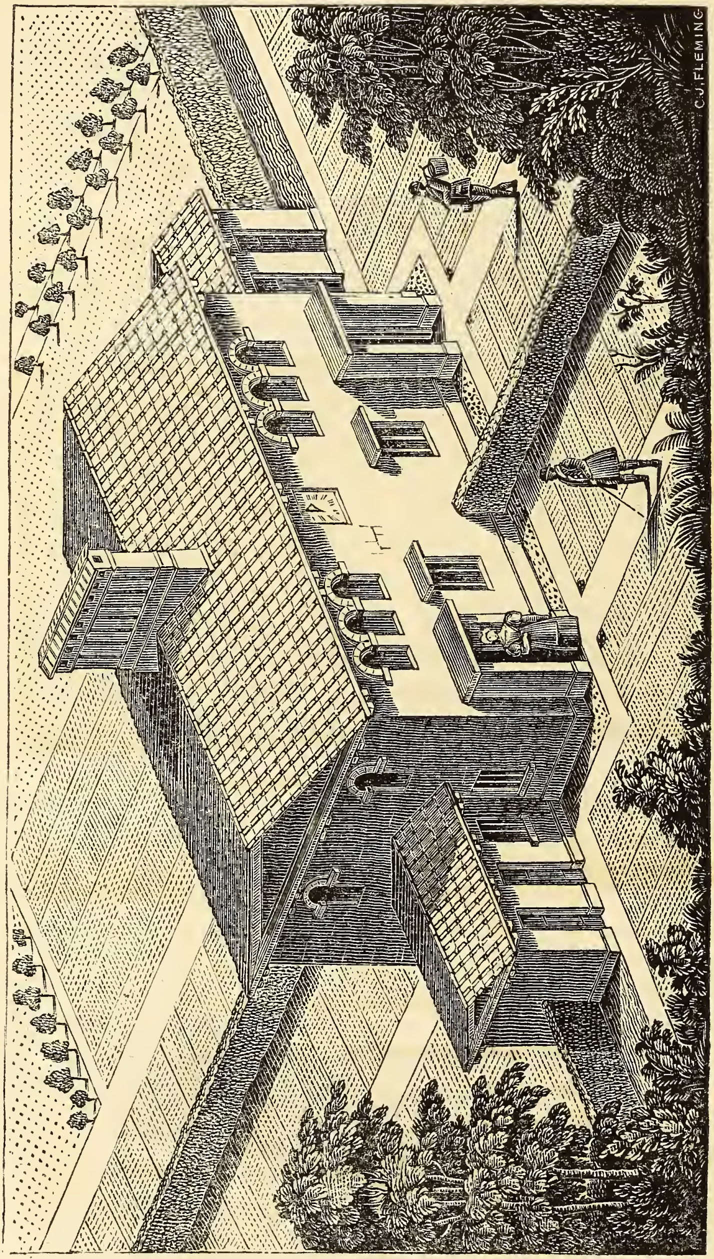
This building is well adapted for a situation among rural scenery, when the ground is greatly elevated above the surrounding surface: and that the irregular form of the roof may be seen against the sky.



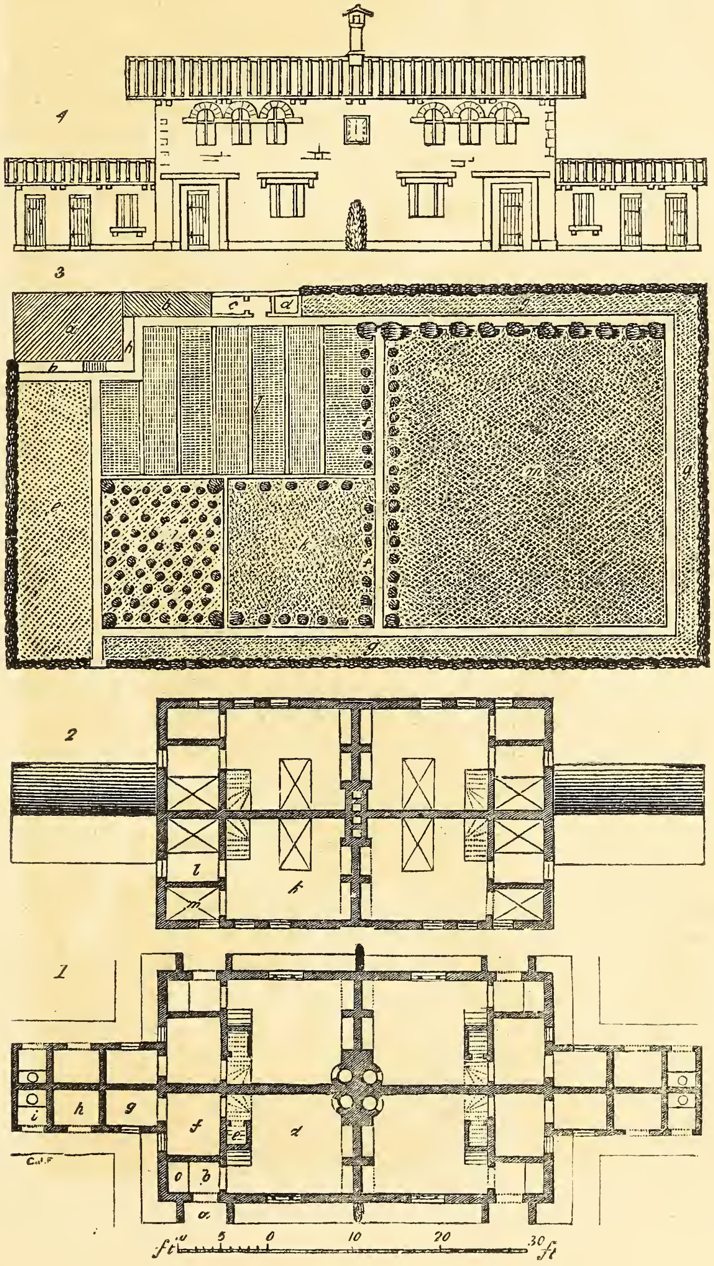
A building, with a plain square horizontal roof, in order to harmonise with the adjacent scenery, should be placed in a situation where the back ground would be seen over the roof, in a varied outline of hills and trees.

In the erection of cottages, however, we should be greatly assisted in producing that harmonious and picturesque effect, so much desired, did we but pay strict attention to the beauties we find in many parts of the country, produced by nature; these, very frequently, give a degree of characteristic simplicity, which is superior to design, and baffles art. When the foreground of a cottage is well arranged with broken ascents and rugged pathways, together with something bold and expressive, such as rocks, large trees, &c. it is of much consequence in producing a pleasant effect.

The walls of this, like the last, may be built of either stone or brick, as the situation may require; stone is preferable when it can be easily procured. If the walls are to be of brick-work, a great saving might be made by leaving a vacuity in the centre of them, to be filled up with a composition of lime, sharp sand, or gravel. This sort of wall is both strong and durable, when properly tied by transverse bricks at every two or three feet. If red bricks are used, or very small blue stones, forming what is called a rubbish wall, then it will be necessary to wash



them over with a composition of lime, sharp sand, lamp black, yellow ochre, and water: the walls in the building of them being left rough to receive it, as the durability of the composition depends greatly on this.


4
3
a
b
c
d
g
h
b
e
j
f
m
g
i
k
f
g
2
l
k
m
1
i
h
g
f
e
d
o
b
a
Cut.F
ft 10 5 0 10 20 30 ft

Walls studded with small pebbles, or small flints, look extremely well, when not methodically done. The roof may be of thatch, as that is the warmest as well as the most characteristic covering for a cottage. The trellis work round the window may be of plain fillets of wood, about an inch broad; or it may be simply boughs of trees, having a seat, as shown by the plan; climbers and twiners might be trained up this trellis-work, so as to form a handsome summer seat.

This design comprises a union of four dwellings. Each house has the accommodation of a porch (1, *a*) to shelter the entrance, which is very desirable, both in large and small houses; (*b*) is the lobby in which there is a shelf (*c*) for holding water pitchers, &c.; and over this there may be another wooden shelf for holding a number of necessary small articles, while underneath the first mentioned shelf may be placed the smaller sized garden implements.

In the kitchen (*d*) there is a low cupboard on one side of the fire-place, the top of which is to serve as a shelf for holding plates and tea-things; and, indeed, there may be three shelves over this for holding necessary stone ware and fancy crockery; and to have a neat curtain tastefully tucked up at tbe top, to be let down in cases of cleaning or dusting. The boiler for heating water for washing, &c., is shown in the kitchen to save the expense of an additional flue and chimney stalk.

Under the stairs there is a closet (*e*) for holding a small supply of fuel from the wood-house. The back house, or back room (*f*) is intended for washing and cleaning in. There is a pantry, (*g*), a wood and coal-house, (*h*), and privy (*i*). The piggery and dust-hole adjoining the latter are shewn in the plan of the garden.

In the chamber floor (2) each house has a bed-room for the man and wife (*k*); and in this room there is a press behind the fire-place for holding cloths, by way of linen closet: on the top of this press may be placed the books that form the small family library. There is a large light closet for male children (*l*), and a bed closet for the female children (*m*); both of which have windows, and may, therefore, be well aired. A trap door may be made in the ceiling of the boy's bed-room, to get up to the garret, where apples, onions, and other roots for winter use may be dried.

(Fig. 3) is a plan of one of the four gardens, each of which contains one rood and eighteen poles.

(Fig. 4) is a geometrical elevation of one side of the building, which will be found of great use to the builder.

(Fig. 5) is an isometrical view of the building and part of the garden, and showing the effect of the whole. It will be readily agreed, on reference to this view, that a number of such buildings would present very interesting objects upon a nobleman's or gentleman's demesne.

The material to be employed in the extreme walls of the building will depend much upon local circumstances. If brick be the material used, there will be a great saving by making the walls hollow, as recommended before. The external walls may be eleven inches thick, which will be quite sufficient; and the runners in that case must be placed so as to leave a vacuity of two inches in the centre of the wall.

As a brick is only nine inches long, and four and a half broad, the transverse bricks, or headers, must be flush on the outside, which will leave an uneven surface on the inside; but this is all the better, as supplying a means for the plaster to take good hold. The foundations must be solid, and a brick and a half in thickness; and the earth must be well rammed round them.

The bearing timbers may be of elm or larch, and the rafters of the principal roof should be four and a half by three-quarter inches. The roof is to be covered with terrometallic Italian tiles; these are of an iron colour, which is much preferable to those of a glaring red. The chimney stack is to have lateral openings, as shown in the view, and to be covered with iron coloured tiles; the shafts to be coated with cement.

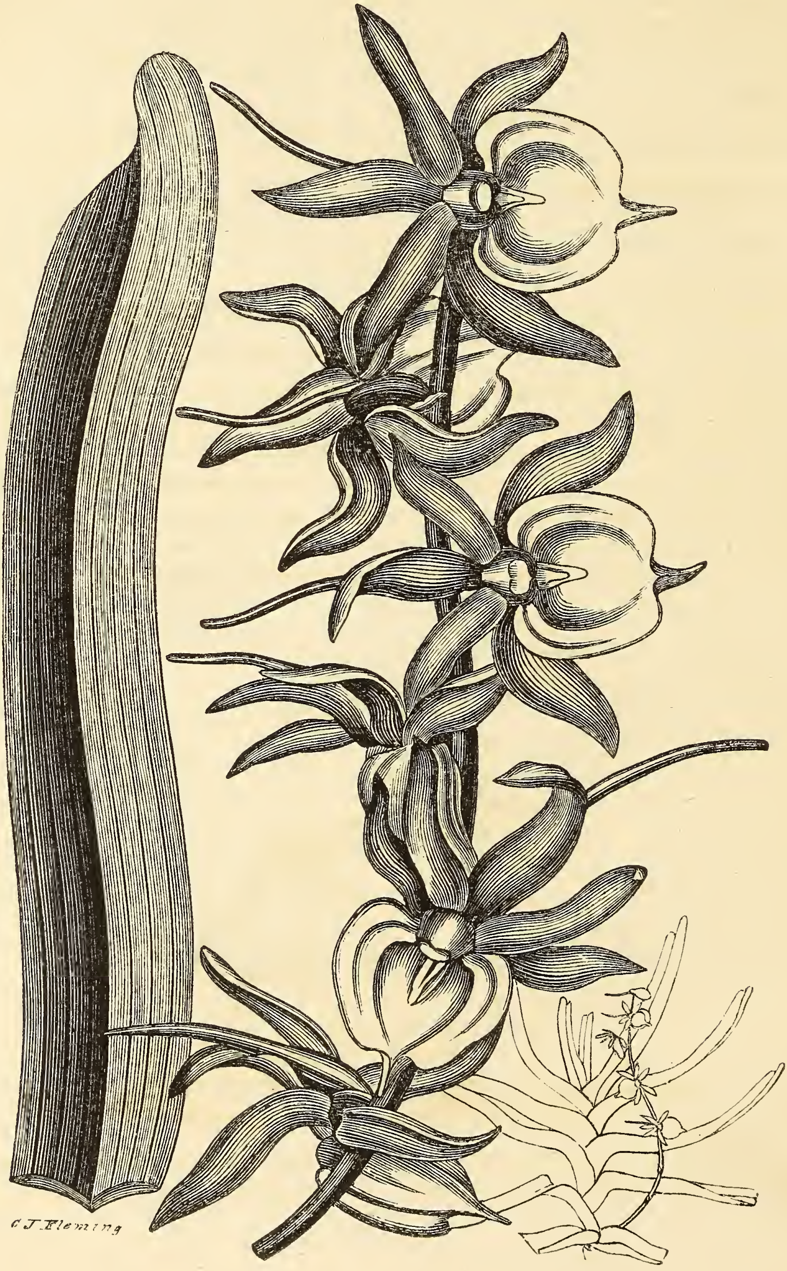
The windows are to have perpendicular wooden mullions or astragals, and to turn round on a pivot and socket in the centre at top and bottom. The porches and window dressings may, for the sake of cheapness be of wooden work, painted of a stone colour. All the internal finishing should be executed in the strongest and plainest manner; and all the external work ought to be painted four times in oil. The internal divisions may be of brick on edge, or of brick noggin flat; but if the building be situated where wood is abundant, they may be of lath and quartering, as the roof is wholly supported by the external walls.

The expense of this building, including the office, if the walls are of brick work, the roof covered with terrometallic tiles, and the joiner's work finished in a strong, but plain manner, will be about £408, or £102 for each house. If the external walls are built of quartering framed as if for internal divisions, wattled with small branches of trees between the quartering, and the spaces filled in with mud, the expense will be greatly lessened, especially where wood can be had cheap; but, perhaps, brick (or stone if cheap) walls, will be found more economical in the long run.

The situation most proper for a building, must depend upon many circumstances, but if there be an opportunity of choosing a situation as to effect—from its character as an Italian structure, it might be advantageously placed in rather a low than an elevated situation. But wherever the situation may be, the building must be so placed, that a line running north and south will be a diagonal of the parallelogramatical form of the ground plan and, above all, in a situation where there is abundance of good spring water. A dial may be very properly placed on the south-east side of the building, shown in the perspective view; and the gardens to be well fenced in by a thorn hedge, as exhibited by the drawings.

ANGRÆCUM EBURNEUM. (Ivory Angræcum.)

This Genus was first established by Du Petit Thouars, in 1822. It consists as far as is at present known, exclusively of epiphyte plants, in the islands of Bourbon,



Mauritius, and Madagascar, and of the south-eastern part of the Continent of Africa. The flowers of the *eburneum* are without scent; both the segments of the calyx (*sepals*) and the petals are bright green; the front heart-shaped segment (*labellum*), is of a beautiful shining white, like ivory, hence its specific name.

The plant is a native of the Island of Bourbon, where it was found both by Col. Bory de St. Vincent, and M. Du Petit Thouars, growing upon trees. It was also met with at St. Mary's, Madagascar, by the unfortunate Forbes, by whom the only plant that is known to exist in Europe was sent to the Horticultural Society. *Bot. Reg.*

It thrives, if treated like Vandæ and Aerides, potted in very turfy peat, in well drained pots, and by carefully avoiding watering over the leaves. It is increased by offsets or detached branches.

DESCRIPTION OF A MUSICAL DIAL FOUNTAIN,

DESIGNED BY MR. A. GODWIN, COLLYCROFT, DERBYSHIRE.

The principles of this fountain may be readily understood; *a, b,* is a pedestal, varied in form as taste or fancy may suggest, provided a sufficient cavity be left as at *d,* for the introduction of a small wire musical instrument, or box, with a horizontal dial at its summit, as *c*. The conducting pipe *p*, *q*, discharges water from the figure *o* into the vessel *f*, which is a tubular vessel, on Dr. Barker's principle, at the bottom is attached the horizontal trunk *r, s,* near the ends of which, but on opposite sides thereof, must be made two holes *n, n:* while the vessel is kept full of water, and continues to have free egress through the holes *n, n,* the pressure is entirely removed from those points, and the pressure against the opposite side will turn round the

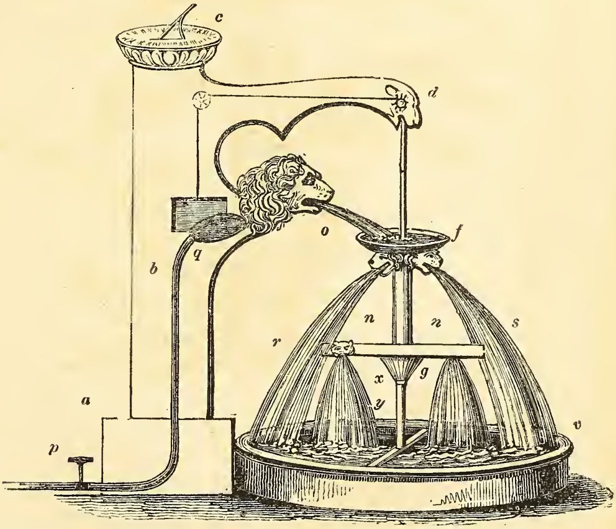


figure or vessel *f, g,* and discharge the water into the basin *v* beneath it. The bottom part, *x, y,* turns in a groove in the cross bar, or at the bottom of the fountain, the top part turning a small cog wheel, within the extremity of the projecting plate *l,* which communicates by wire or otherwise with the instrument it has to play, which being fixed within, or near the figure *o,* makes it appear as though the sounds proceeded from the figure. The overplus water may be projected from as many fanciful figures as may be thought necessary, placed round about *f,* altogether forming an unusual, and very pretty effect.

PREPARATION AND MANAGEMENT OF PLANTS DURING A VOYAGE FROM INDIA. BY DR. WALLICH.

COMMUNICATED TO THE HORTICULTURAL SOCIETY OF LONDON.

The subject may be considered under the four following heads. 1. The preparing plants for the voyage: 2. the packing them: 3. their treatment during the voyage: and 4, their management upon their arrival.

1. *With regard to preparing plants for a voyage,* it is of great importance to attend to the age and strength of the subjects.

Very often plants of tender age, or already weak and sickly, or grafts only recently or imperfectly united to their stock, are crowded together hastily into the cases, in which they are to perform their voyage, and they are then put on shipboard without being sufficiently rooted.

No wonder that plants thus treated should soon perish, or, if indeed a few of them should survive their transmission, that they should be so sickly upon reaching Europe as to perish presently after. To obviate this, invariably select plants already advanced in age, with a strong root and thick stem; and only such grafts as have already been established two or three years on old healthy stocks.

2. *In Packing,* the following directions particularly require to be observed. It has been the custom to make the chests very large, and to crowd into such chests, as many plants as they will hold; this practice has had, amongst others, this bad effect, that captains however well disposed at first to pay the plants every attention, have soon found the cases troublesome, unwieldy, and unsightly.

No case should be more than three feet long, eighteen inches in width, and sixteen in depth below the roof. The depth of the roof should be sixteen inches more, so that the shutters, when opened, will be the same depth as the sides of the boxes. The breadth of the upper rail should be five inches, which will admit of a piece of painted canvas sufficiently large to cover the whole sides, to be rolled upon it, and fixed to each side.

On no account use the common tarred canvas, which is a very imperfect defence against rain and sea spray, and in the next place, that whenever a number of chests are to be placed in a row, close to each other, it would be preferable to use one piece of canvas instead of many.

Some attention should also be paid to the neatness of the appearance of the cases, as captains are very unwilling to allow the deck to be occupied by unsightly objects; they should be well clamped together with iron, and painted. On no account should holes be bored in the ends for passing rope handles through; the latter are perfectly useless. The roofs should be glazed either with stout glass or with the Chinese oyster-shell; or with plates of thick talc.

Each plant should have a separate square pot made of wood, of such a size, that eight should be contained in each case; they should not fit too tightly together, but should be so contrived, that any one may be lifted out without disturbing the remainder. This renders it easy to replace deaths, if the ships touch at any port on their voyage.

The pots should have three or four holes bored in their bottoms; but there should be no holes in the bottom of the chest; for it is at such apertures that rats on ship-board always commence their depredations, and there is no advantage whatever in the holes.

Between the bottom of the pots and the bottom of the case, should be a layer three inches deep of broken glass and pebbles; the former renders it impossible for vermin to establish themselves in the cases. The cases should be raised two inches from the deck by little feet.

3. *In the treatment on board,* too much attention cannot be given to the necessity of exposing the plants to the open air, at all times when the weather will admit of it. As a general rule, it may be said, that the boxes should be kept shut as long as the sun is above the horizon, and opened during the night, whenever the weather appears steadily fine.

In cases where the chests are placed under the awning, the former precaution would be less necessary, and a due consideration of the changeableness of weather at sea, will, of course, ensure particular attention to the closing of the roofs, if bad weather should come on. Whenever a shower falls the plants should be fully exposed to it, taking care at the same time that too much moisture be not admitted.

With regard to watering, it is desirable that the captain should provide for each plant one pint per day; because, although in rainy weather no water is required, yet if the weather is very hot, a larger allowance than this may be necessary. The water should be given in such a manner, that the leaves and branches may be refreshed, besides the root; *part* should therefore be sprinkled over them, the rest poured on the earth.

Generally, half a pint of water should be sprinkled over the plants before you shut them up in the mornings, and the same quantity when the cases are opened in the evening; a greater quantity will, however, of course be given in hot, dry weather, than when the sky is overcast, and the air moist.

4. *Upon their arrival in England,* the plants should not be immediately taken from their pots, but allowed to remain in them in a conservatory or hot-house, according to the nature of the plants themselves, or the season of their arrival. Water should be sparingly given, and the plants well cleansed from the dust and other matters which may be collected on their leaves during their voyage.

HISTORY, INTRODUCTION, NATURAL HABITATS, AND CULTIVATION OF ORCHIDEOUS EPIPHYTES,

BY DR. LINDLEY.

EXTRACTED FROM THE HORTICULTURAL TRANSACTIONS, VOL. I. PART I., NEW SERIES.

Botanists were aware, at a very early period of the history of science, of the existence in tropical countries, of a race of plants found growing upon the trunks of trees, very different from anything wild in Europe; and not less remarkable for their beauty or fragrance, than for the extremely singular structure of their flowers.

The figure of *coatzonte coxoahitt,* by Hernandez, a nearly related species of which has been since described by Humboldt, under the name of *Anguloa superba,* the plates of Plumier, of Rumphius and Rheede, the drawings of the Chinese, and the reports of travellers, had all contributed to excite a lively desire in the minds of the collectors of rare or curious plants, to add these wonders of the tropical forest to the number of objects compelled to submit to the skill of the cultivator.

It does not, however, appear that any success attended the first attempts to introduce these plants to Europe; or if they reached this country, they were speedily lost.

The *Vanilla* seems to have been the first that became established in the hot-houses of England, and to have been in fact the only kind that was known to Miller. According to the Hortus Kewensis, two or three and twenty species only had become fixed at Kew during the last ten years of the last century, and it is certain, that from this period, up to the establishment of the Society's garden at Chiswick, the number had increased but very slowly.

A stimulus had indeed been given to the pursuit by Mr. Cattley, but the single efforts of that gentleman had not been sufficient to produce any considerable accession to the number of species in cultivation, although they contributed, in an important degree, to improve the then existing methods of treating them. It would seem that not more than twelve or fourteen species had been added to the garden at Kew, in the first thirteen years of the present century, and such bad success had attended their cultivation upon the continent, that only nineteen species were mentioned, in 1822, in Professor Link's Catalogue of the garden at Berlin, one of the richest in Europe.

It was supposed that this very remarkable instance of want of success, in the preservation of plants of such universal interest, was due to some peculiar difficulty in their cultivation, and it was resolved that an attempt should be made in the garden of the society, to overcome it. A corresponding feeling elsewhere seems to have been called forth about the same time, and probably by the society's example; so that it has come to pass, that, not to mention the Chiswick garden, private establishments in this country can boast of far richer collections, and more successful management than the most celebrated gardens of the continent.

It is well known that the stoves of Messrs. Loddiges of Hackney, Messrs. Richard and Arnold Harrison of Liverpool, and Mr. Cattley of Barnet, are unrivalled in the number of species that they contain, and that the total number now found in the gardens of Great Britain, is certainly not less than two hundred* ; while the catalogue of the Jardin du Roi at Paris, made up the last year, enumerates but nineteen.

In instituting this inquiry, the obvious question was, what are the conditions of soil and climate, under which these plants flourish in their native place ? but it was found exceedingly difficult to answer this question with any degree of precision. The data that existed upon the subject were imperfect, and the conclusions that were drawn from them were necessarily proportionably unsatisfactory. It was only known that generally their native climate was the tropics, and their food the decayed vegetable soil that collects upon the trees.

All our earliest experiments were consequently unsuccessful ; we lost our plants as quickly as we received them, and when we preserved a single species out of an entire collection, we thought we had met with great success. By degrees, however, we discovered better means of management, and acquired more precise information upon the subject of their native places of growth, the substance of all which may be said to amount to this, that a well drained soil, shade, a high temperature, and an atmosphere nearly saturated with humidity, are the conditions that are requisite to ensure their successful cultivation, and that soil itself is of little importance to them. No soil or temperature will nourish them in drought, and any soil is good when the temperature and atmospheric humidity are carefully regulated.

It has been found that the same plants which refused to grow when placed upon the stage of a hot-house, the air of which possessed the necessary conditions of heat and vapour, flourished with all their native luxuriance, if the pots in which they were planted were suspended freely by wires from the roof ; a difference which no doubt depended essentially upon drainage. Moss alone would, under these circumstances, maintain in perfect health plants which the most carefully managed soil appeared to kill, if the humidity of the air, and the drainage were unattended to.

The facts collected relative to these plants, are the following :—

Orchideous epiphytes grow naturally upon trees, in the recesses of tropical forests ; they establish themselves in the forks of branches, and vegetate amidst masses of decayed vegetable and animal matter : in consequence of their position, there cannot possibly be any accumulation of moisture about the roots. They also grow equally well upon rocks and stones in similar situations.

---

* Since the publication of this paper in 1830, very many splendid species have been introduced. Dr. Lindley in his new work on Orchideæ, has described no less than 1000 known species, how many are introduced we are unable to say ; we possess at Chatsworth upwards of 240 species, including such as are unnamed.—J. P.

Shade seems essential to them, their natural situation being in deep forests, or among branches of growing trees. In Brazil they exclusively occupy damp woods, and rich valleys among vegetation of the most luxuriant description, by which they are embowered. In Nepal, according to Dr. Wallich, they grow in company with ferns, and the thicker the forest, the more stately the trees; the richer and blacker the natural soil, the more profuse the orchideæ and ferns upon them. There they flourish by the sides of dropping springs, in deep shady recesses, in inconceivable quantity and with an astonishing degree of luxuriance.

High temperature and excessive humidity are together the other conditions essential to the well-being of these plants. The hottest countries, if dry, and the dampest, if cool, are destitute of them, whilst there is no instance of a country both hot and damp in which they do not swarm.

There is perhaps no part of the world in which they more abound than India; in the Malayan Archipelago, the climate of which is intensely hot, the mean temperature being between 77° and 78°, and damp to saturation, they exist in enormous quantities. In Nepal, they are only found upon the sides of the lower mountains, where they vegetate amongst clouds and constant showers; while on the continent of India they are almost unknown, their place being occupied by parasitical *Loranthi.* The traveller finds himself in the morning on the dry plains of Hindostan, where the mean temperature is 80°, and where all the trees are destitute of *Orchideæ,* and at noon he is at the foot of the first range of Nepalese hills, where every tree teems with that class of plants.

There are, however, places on the continent of India, where they are not less numerous than in Nepal; at the estuaries of the Ganges, the Burhampoota, (Burmapootra), the Irawaddi, and the rivers of Martaban, they exist in vast quantities, but all these stations are exceedingly damp. In the Botanic Garden, Calcutta, they grow most vigorously during the rainy seasons, but in the fiercely hot season that begins in March, and lasts till the 10th of June, they perish, notwithstanding all the care they receive. The humidity of the Isle of France and Madagascar is well known, and the temperature of the former has been computed at 80° 4′; here vast quantities abound.

In Africa they are very rare; its sandy deserts and parched atmosphere are unfavourable to their growth, notwithstanding the high temperature of that torrid region. They are, however, found at Sierra Leone in abundance, where the mean temperature is 70° 7′, but modified by vapours, the existence of which is unfortunately but too well ascertained. At the Cape of Good Hope they are wholly unknown, and although the temperature of the northern parts of the colony is probably at least equal to that of the Mauritius, yet the aridity of the region prevents a trace of them being seen.

In America, their favourite stations, according to Humboldt, is in the gorges of the Andes of Mexico, New Grenada, Quito and Peru, where the air is mild and humid, and the mean temperature 63°—67° Fahr. (17°—19° cent.). In these localities they are so abundant, that according to the authors of the Flora Peruviana, above 1000 species might be found in Tarma, Huanuco, and Xauxa alone.

They are not seen farther north than Florida, where a single species, *Epidendrum conopseum,* is found on the Magnolia; but it is well known that the vicinity of the Gulf of Mexico, and the effects of the gulf stream, give the vegetation of Florida a tropical, rather than extra-tropical appearance. In that country this solitary representation of tropical *Orchideæ* exists in the same region as myriads of *Tillandsia usneoides,* which usually vegetates beneath the influence of the dampest tropical atmosphere.

In the West India Islands they exist in vast quantities, particularly in Jamaica and Trinidad, not, however, so much upon the coast, as on the lower ranges of hills. This is in conformity with their habits elsewhere; in these islands the air of the level of the sea is very dry, while that of the mountains is unusually humid.

At Rio Janeiro the mean temperature is 74° 3′, and much higher inland; there the woods are so damp that it is difficult to dry plants, and in such situations inconceivable multitudes of *Orchideous epiphytes* are found; but at Buenos Ayres, where the mean temperature is 67° 6′, and the air dry, they are unknown; and in the high dry land of Mendosa, where the aridity is still greater, the whole order almost disappears.

On the west coast of South America, as high as Lower Peru, they are unknown; a circumstance which will not be surprising, when we consider the effect of currents setting round Cape Horn, which bring the mean temperature of even Lower Peru itself down to 60° at night, and how arid the whole of that region is, with the exception of a few valleys.

From this it may safely be deduced as a certain fact that the most favourable conditions for the growth of *Orchideous epiphytes* are a well drained soil, a shady situation, a saturated atmosphere, the mean temperature of which is not less than from 79° to 80°; and a complete protection from dry parching winds. Such appears to be the climate to which they are naturally subjected, in most cases; with the exception of the species found in the Mexican Andes.

Two species are indeed found in Japan, the mean temperature of which is no doubt much lower than the heat stated above.

If we reflect upon the natural habits of *Orchideous epiphytes,* and upon the little similiarity that often prevails between the atmosphere of hot-houses, and that in which, alone, it has been seen that they can exist, we shall cease to wonder at any failure that may have attended their cultivation. No accuracy was formerly observed in the proportion of vapour and temperature in the atmosphere of a stove; a circumstance which must have been fatal to many plants besides those now under consideration. Even at the present day, the air of many hot-houses would be found to indicate 6° or 7° of dryness, a condition to which such plants as these are never subjected by nature; in those districts of the East and West Indies where such a climate prevails, we have seen that they disappear, but that as soon as atmospheric humidity increases sufficiently, they spring up in myriads from every tree.

OPERATIONS FOR DECEMBER.

Auriculas and Polyanthuses must be well secured from frost, and have plenty of air in fine weather, p. 9, rules 3 to 5, and p. 108, rules 3 to 5.

Azaleas of the tender kinds, in increased temperatures, will now be in flower, p. 126.

Camellias in frames may be introduced into warmer situations, to bring them into flower. If the heat in which they are placed exceeds 60 degrees by day, and 50 by night, the flower buds will be liable to fall off without expanding, page 34, rule 15.

Chrysanthemums in pots will now be in full flower, give a good supply of water and air in fine weather, p. 189, rules 13 and 14.

Calceolarias standing in the greenhouse, may some of them require potting, page 2 4 ?

Cyclamen Persicum plunged in frames, or planted in the open borders, must now be introduced into a little heat, until the flower buds are formed, when they may be removed to cooler situations, where they will flower.

Dahlia Roots must be dried previous to laying up for winter, or they will be liable to rot, p. 107, rule 32.

Greenhouse Plants must receive very little water, and as much air as the weather will allow. Only make fire sufficient to keep out the frost, and preserve the house free from damp, p. 137.

Forcing. Introduce pinks, carnations, rhododendrons, roses, &c., &c. into the forcing house.

Roses now introduced into the forcing house produce flowers in February, p. 144.

Mignonette and Ten Week Stocks in frames must be exposed to the open air as much as the weather will allow, but they must be well secured from frost.

Tulip Beds should be sheltered from heavy rains or snow by mats or straw, page 161.

PŒONIA EDULIS REEVESIANA.

(MR. REEVE'S PŒONY).

CLASS.	ORDER.
POLYANDRIA.	DIGYNIA.

NATURAL ORDER.

RANUNCULACEÆ.

GENERIC CHARACTER.—*Calyx* of five sepals, leafy, persisting. *Corolla* of five or of many petals, without claws. *Stamens* below the germen, filaments filiform, anthers oblong, erect, two-celled, bursting outwards. *Style* none. *Stigmas* from three to five, sitting, thick, recurved, downy, persisting. *Capsules* three or five, full of seeds, which are roundish, hard, and albuminous.

SPECIFIC CHARACTER.—*Roots* thick and fleshly. *Stems*, many. *Leaves* and flower as represented on the plate.

THIS splendid new herbaceous plant is a native of China, from whence it was introduced by Mr. Reeves, after whom it is named, and to whom this country is indebted for many other Chinese rare plants. The roots of many of the varieties of *P. edulis* or *albiflora* are boiled in broth by the Monguls.

This plant is perfectly hardy, and requires the same treatment as the other varieties of *edulis*, that is to be planted in rich loamy soil, and increased by dividing the roots.

Our drawing was taken from a plant in the collection of Mr. Tate, of Sloane Street, who has several other unique things from the same quarter of the world.

CRATŒGUS OXYACANTHA VAR. ROSEA.

(DEEP ROSE COLOURED FLOWERING HAWTHORN.)

LINNÆAN CLASS AND ORDER.	NATURAL ORDER.
ICOSANDRIA DI-PENTAGYNIA.	ROSACEÆ.

GENERIC CHARACTER.—*Calyx*, tube pitcher-shaped, limb in five divisions. *Corolla*, petals subrotund. *Stamens* seated on a glandular ring within the calyx. *Styles*, from two to five, smooth. *Fruit*, a fleshy pome, somewhat globular, closed, five-celled. *Seeds* single or two together in each cell. *Shell* bony.

SPECIFIC CHARACTER.—*Leaves* rather smaller and not so deep a green as the common. *Growth* irregular, branches spreading obliquely upwards or horizontal, with points drooping, thickly set with flower-bearing spurs along their whole length. *Habit*, in other respects, like the common hawthorn.

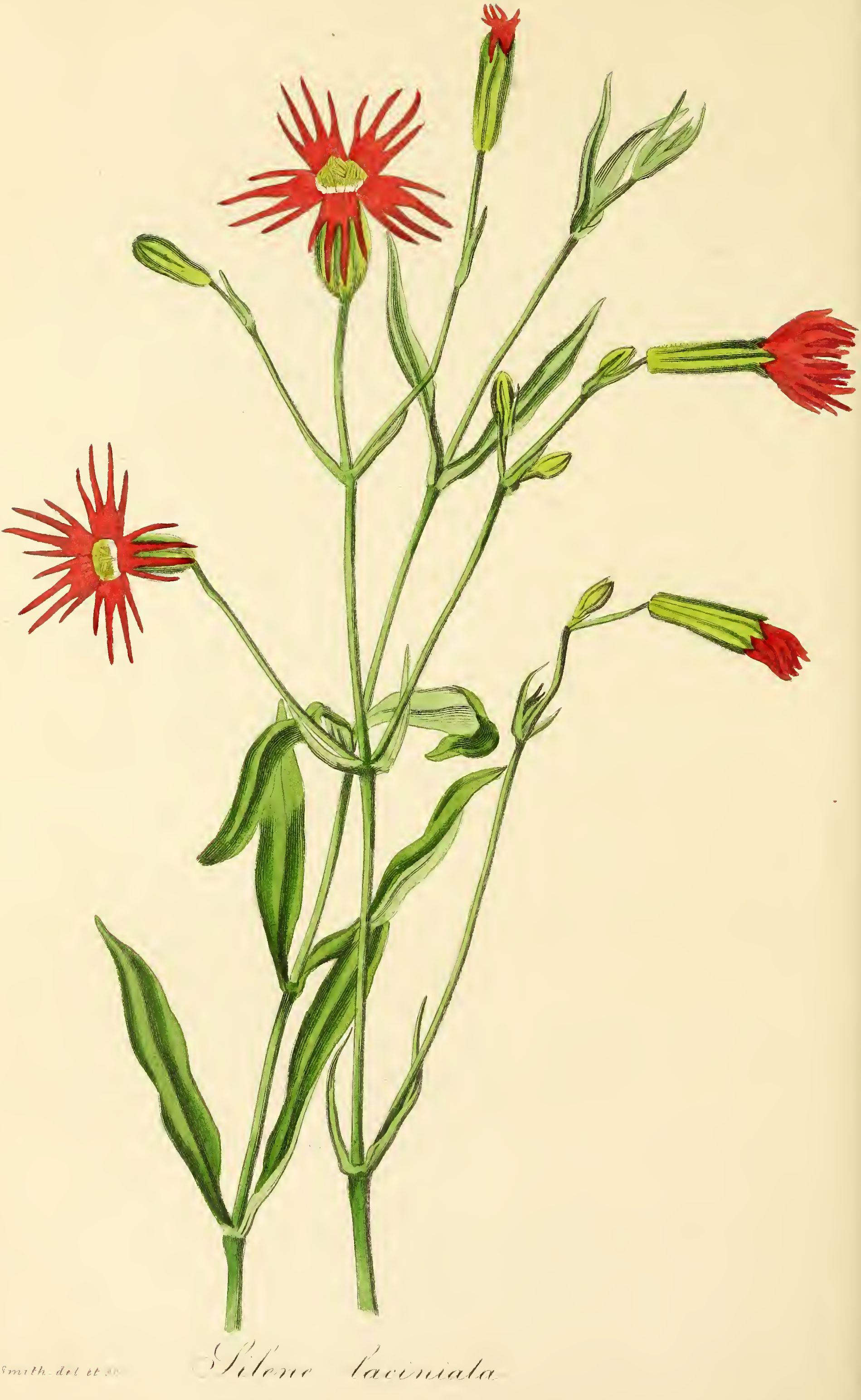
OUR drawing was taken from one of a fine assortment of standards and dwarfs, in Mr. Malcolm's, Kensington Nursery, in June last.

We have long had the common scarlet flowering hawthorn in our shrubberies; and many of the wild ones, like the double white variety, may be seen to die off a blush tint. But our present subject is much more deeply vivid rose colour than any other, and no less conspicuous in this respect than admired for the profusion and elegant disposition of its corymbs of flowers along the upper sides of the branches, forming perfect garlands

The common hawthorn or "May," as it is provincially called, with its snow-white blossoms ranged along each spray, is admired by everybody; but how much more attractive is this scarce and splendid variety, combining the intense colouring of the rose with the delicate elegance of the kalmia.

The early history of this ornamental plant is somewhat imperfect. Mr. Malcolm received it from a nursery at Perth (Messrs. Brown and Dickson s?), nearly twenty years ago, and though it has been extensively propagated at Kensington, and no doubt elsewhere, it does not appear to have been noticed, nor so extensively planted as it deserves.

It is propagated by working on the common thorn, either as dwarfs, or as half or whole standards, for lawns, on which no other hardy flowering tree can be more ornamental. It would even add a richness and be no mean embellishment of the flower garden.



F. W. Smith del et sc.

Silene laciniata

SILENE LACINIATA.

(CUT-PETALLED CATCHFLY.)

CLASS.
DECANDRIA.

ORDER.
TRIGYNIA.

NATURAL ORDER.
CARYOPHYLLEÆ.

GENERIC CHARACTER.—*Calyx* angular, five-cleft. *Petals* five, clawed, as long as the calyx. *Capsule* slightly three-celled opening at the end. *Seeds* many, kidney-shaped.

SPECIFIC CHARACTER.—*Stem* erect and branching, covered with soft hairs. *Leaves* spear-shaped, acute. *Flowers* axillary, and terminal. *Calyx* cylindric, inflated, greenish yellow, with a slight tinge of red. *Corolla* twice the length of the calyx, petals five, each cut into four narrow segments two thirds of the length of the limb, segments acute, whole of the corolla bright scarlet.

THIS plant was introduced from Mexico, in 1823, by the Right Hon. George Canning, and more recently by Mr. Graham.

It is nearly hardy, and thrives pretty well in a cool part of the greenhouse; but if the situation be dry, the plant is apt to become infested with the red spider. This may be remedied by occasionally sprinkling clear water over the leaves in fine weather at the time of watering. It may also be grown in a frame, with little trouble, or in the open border during the summer season.

The best sort of soil is a mixture of sandy loam and peat. It is increased by cuttings and by seeds, which are sometimes produced.

Our drawing was taken from a plant which flowered in the greenhouse at Chatsworth.

PHLOX CORDATA GRANDIFLORA.

(GREAT-FLOWERED CORDATE LICHNIDEA.)

CLASS.	NATURAL ORDER.	ORDER.
PENTANDRIA.	POLEMONIACEÆ.	MONOGYNIA.

Generic Character.—*Calyx* tubular, five-toothed. *Corolla* tube curved, petals five, salver-shaped. *Stigma* trifid. *Capsule* three-celled.

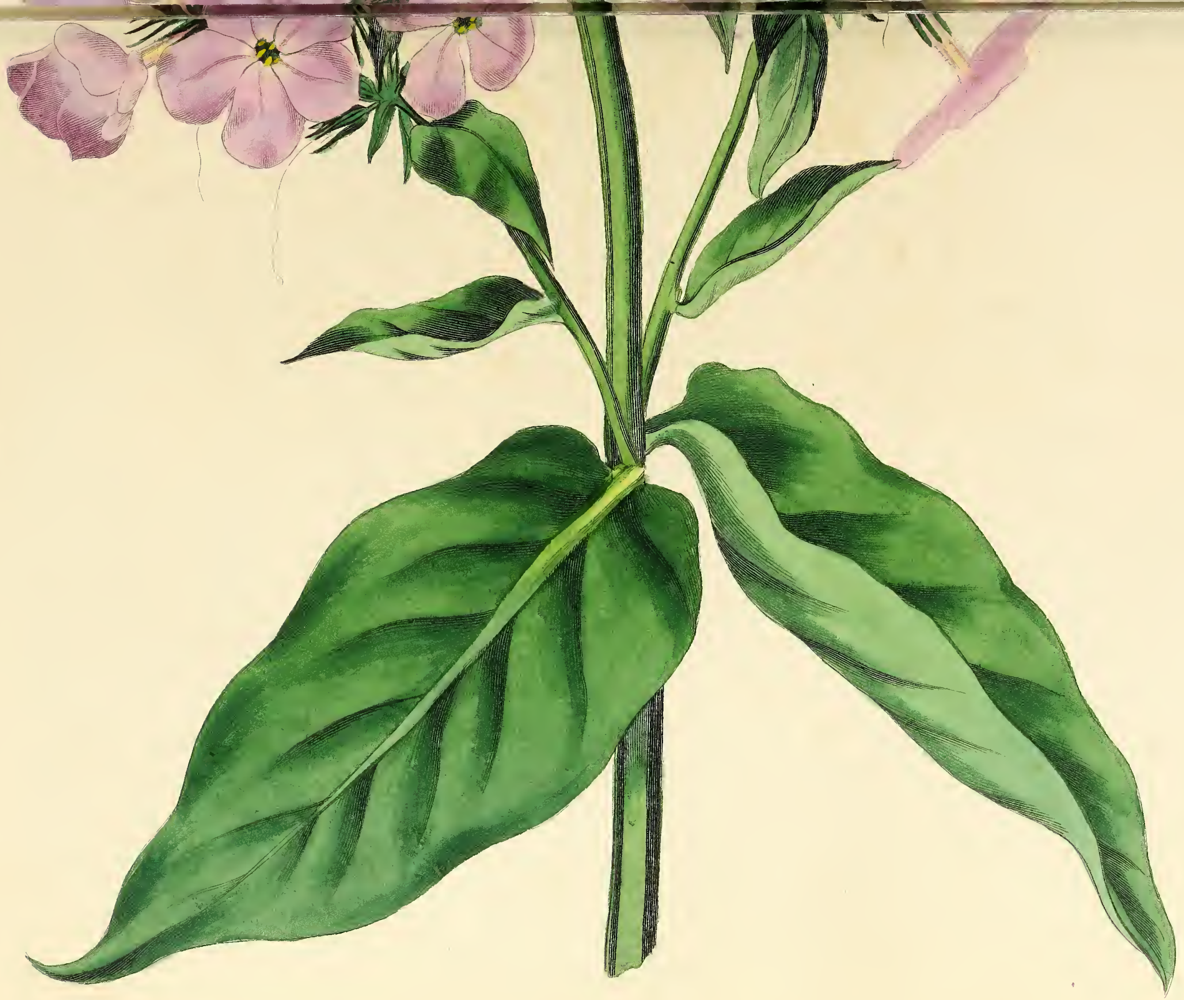
Specific Character.—*Stem* robust, branching, three feet high. *Leaves* large, oblong, cordate, acuminate, smooth. Spike of flowers two feet long, commencing at a foot from the ground. *Calyx* light green, smooth, slightly tinged with purple. *Corolla,* tube an inch long, slightly curved, petals rounded, when expanded an inch and a quarter diameter, rose colour, tinged with blue, eye white, delightfully fragrant, resembling the lilac, continues long in flower.

This beautiful hybrid phlox was raised by Mr. Clark, nurseryman and florist, East Retford, Nottinghamshire. It comes the nearest in habit to the Cordata, of which it is most likely a variety; from this however it materially differs in the size of the flower, and the clear white eye. It grows very strong whilst young, and produces leaves of a large size, but the whole plant is dwarf, seldom rising higher than three feet, two of which compose the spike of flowers.

The spike of flowers is something pyramidal, the lower branches projecting about a foot from the main stem, and gradually diminishing in length until they terminate at the summit of the plant in a crown of flowers.

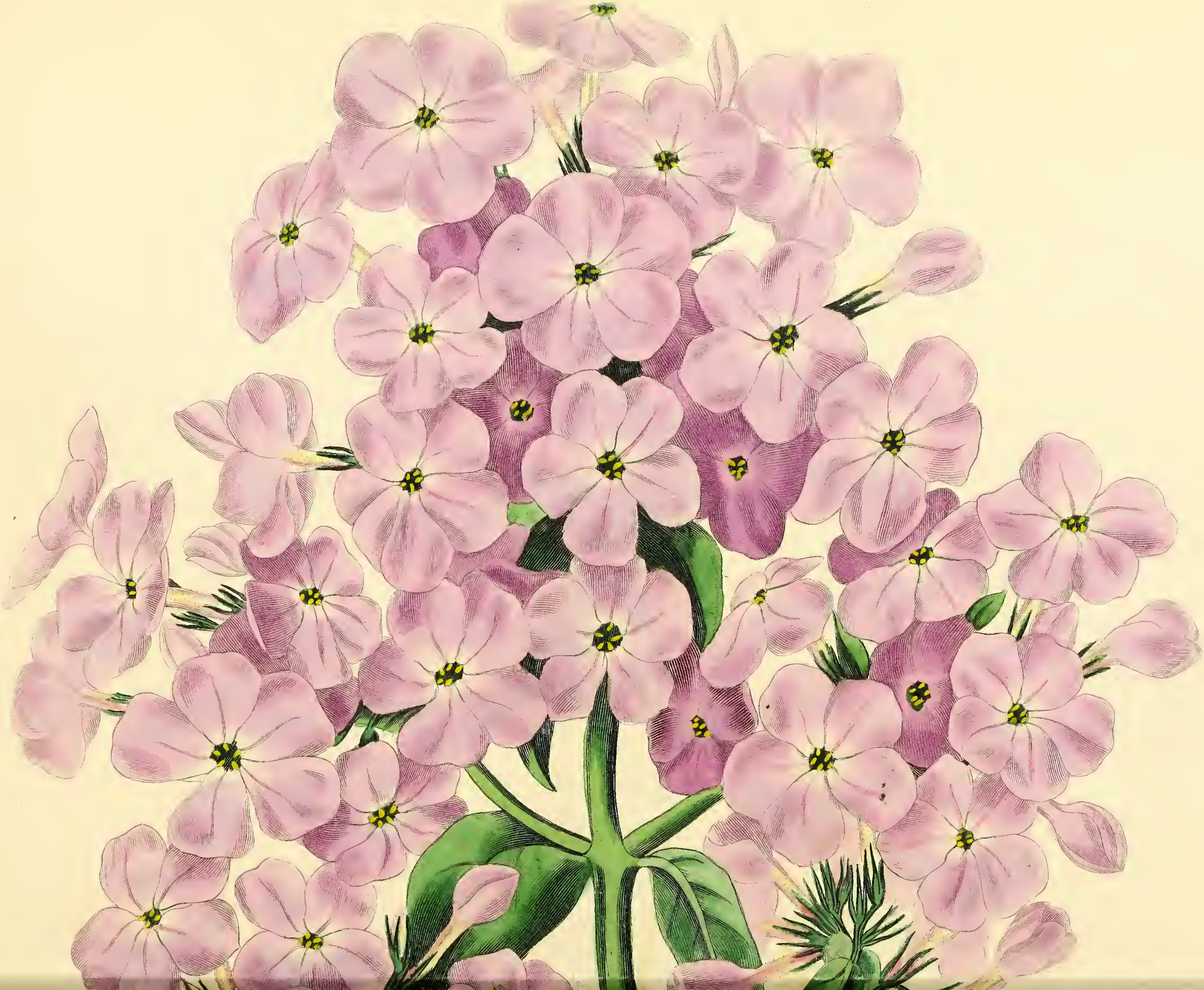
When rising from the ground in the spring, it has much the appearance of young mint. It commences flowering about the middle of July, and will by all appearance in favourable situations continue till the middle of September.

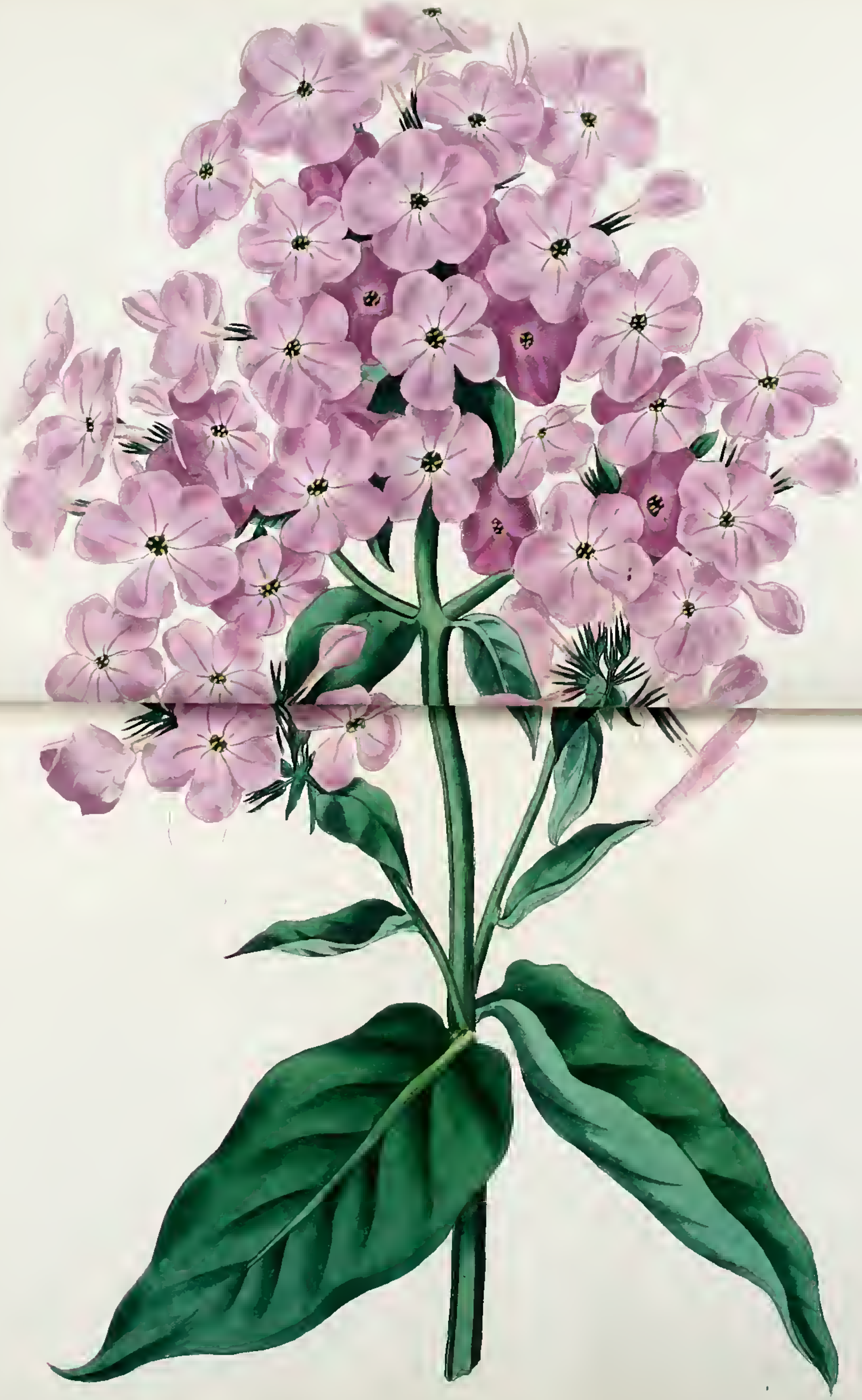
It is a beautiful showy kind, perfectly hardy, and no doubt will be found to thrive in almost any soil and situation, but particularly in a light rich loam. The fragrance is more powerful than the corymbosa, indeed it nearly equals the common lilac.



E W. Smith del et sc

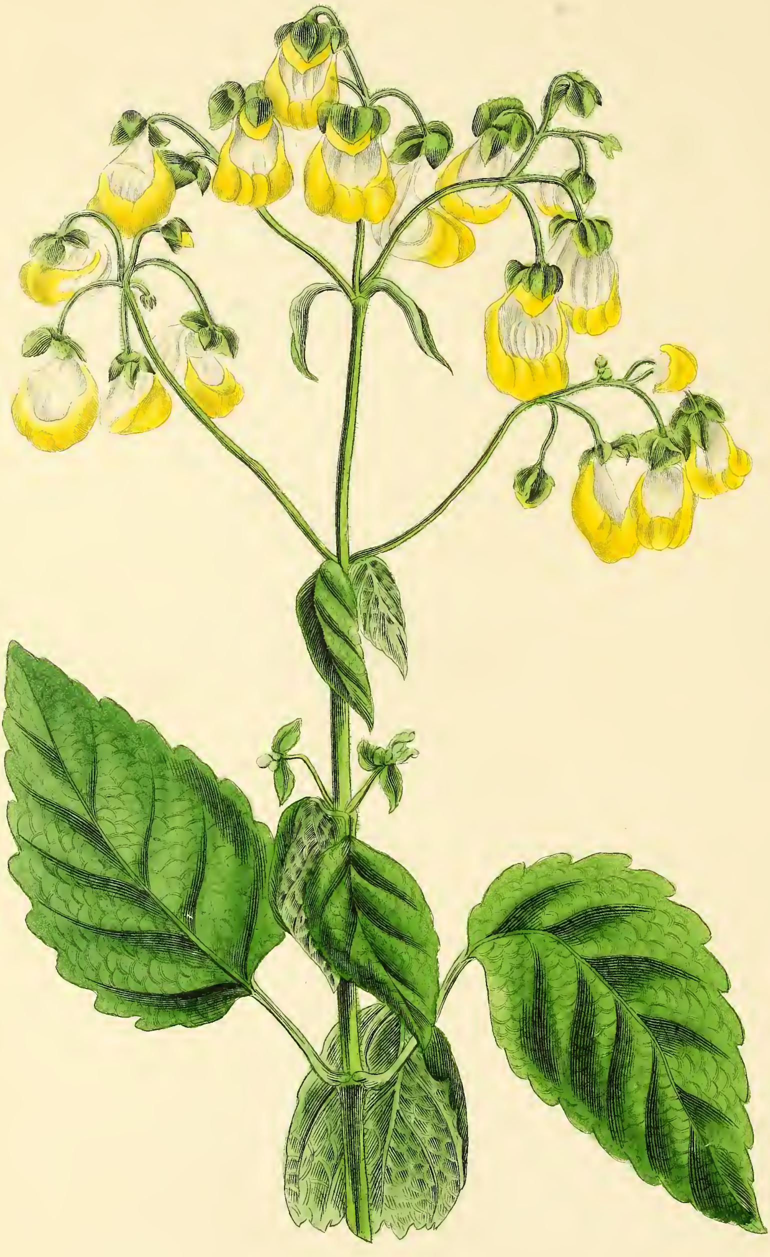
Phlox cordata grandiflora.





[illegible] del.

Phlox cordata grandiflora



S.W. Smart del. & sc.

Calceolaria bicolor

CALCEOLARIA INTEGRIFOLIA VISCOSISSIMA.

(VERY CLAMMY-STEMMED SLIPPER-WORT.)

CLASS.
DIANDRIA.

ORDER.
MONOGYNIA.

NATURAL ORDER.
SCROPHULARINEÆ.

Generic Character.—*Calyx* four parted. *Corolla* two-lipped, and inflated. *Capsule* two celled.

Specific Character.—*Stem* shrubby, from two to four feet high, covered with soft downiness, very clammy. *Leaves* obcordate, very rough and unequal in appearance, opposite, scented, covered thickly with woolliness, clammy on the under side. *Corymbs* panicled. *Flower-stalks* half to three quarters of an inch long, slender. *Calyx* green, four cleft, segments broadly ovate. *Corolla* two lipped, upper lip about half the size of the lower one, bright orange colour. *Stamens* two, inserted at the base of the upper lip.

Synonym.—Calceolaria salviæfolia. Feuill. Per. vol. 3. p. 13.

Of this beautiful variety of *Calceolaria integrifolia,* we obtained cuttings from the London Horticultural Society. Its rich, yellow, dense corymbs of flowers, render it a very desirable plant for the flower-borders, during the summer season; and in the winter it enlivens the greenhouse.

It is scarcely ever out of bloom; and becomes a shrub of some size. Dr. Hooker informs us that Mr. Cameron, of the Birmingham Botanic Garden, raised it from seeds. It may easily be propagated by cuttings.

REPRODUCTION OF PLANTS.

There is not a more interesting phenomenon in the history of the vegetable kingdom, than that of the constitutional power of plants to reproduce themselves. The production of seed to perpetuate the species is the grand purpose of their being. The life of many plants is limited to this principal effort, and when completed they instantly die. This circumstance has gained for certain descriptions of plants the titles of annuals, biennials, and perennials. Annuals spring up, perfect their seeds, and die in the course of one season; biennials require parts of two summers to arrive at perfection; the life of perennials is not limited to the act of ripening seed, but to the durability and spreading properties of their roots. There is another description of plants which do not come in under any of those titles, though their production of flowers or seed terminates their life. These are such as require an uncertain number of years to bring them to perfection, and which are more or less, according to the circumstances of soil and temperature in which they happen to be placed. The *Agave Americana,* commonly called the American Aloe, arrives at its utmost magnitude and perfects its seeds in the short space of four or five years in its native climate; whereas when kept as a greenhouse plant in this country, forty, fifty, or more summers must elapse before it puts forth its flower-stem, which is the final effort of the plant.

Vegetables resemble animals in being sexual; that is, they have male and female organs on the same or on different plants: and without the mutual influences of these, no perfect seeds can be matured. The greater number of plants have bisexual flowers; in this case, there is but little risk of failure of perfect seed, because the essential organs are so near together. Some are bisexual plants, that is, having unisexual flowers distinct from each other, but on the same root. Others are unisexual plants, that is, the male flowers are on one plant, and the females on another. It may easily be conceived that unless, in this last case, both plants stand near together, no perfect seed can be expected. There is yet another disposition of unisexual and bisexual flowers, called polygamous, in which male flowers are on one plant, females on another, and male and female on a third. This remarkable disposition is exemplified in the fig.

Thus there are bisexual flowers:—examples, the tulip and the rose; bisexual plants, as the oak and hazel; unisexual plants, as the poplar and willow; and polygamous or anomalous plants, as is exhibited in the genus fig.

These are the provisions of nature intended for ensuring the maturation of seed, and by which the dissemination of the different species of plants is maintained. Even those tribes of vegetables which have no visible flowers, viz. all the cryptogamous orders of ferns, mosses, lichens, hepaticæ and fungi, have nevertheless the hidden power of discharging parts of themselves called sporules, which are endowed with all the properties of perfect seeds; because wherever they fall on soil or other substance favourable to their growth, there they fix themselves and prosper.

The tenacity of life of some seeds after being discharged by the parent plant is astonishing! It is a well authenticated fact, that seeds may remain buried deep in the earth for centuries without losing their vegetative powers. On newly broken up land, or on earth dug out from a considerable depth in the earth, plants will appear which have never been observed before on the same spot in the memory of man.

Seeds, like all the other members of a plant, have rudimental existence like the ovæ of animals long before they are impregnated by the pollen from the anthers; but without impregnation they are wholly destitute of vitality. Fruits which are the investments of seeds may arrive at perfection though the seeds are absent or wholly defective. This is invariably the case with figs ripened in this country; the seeds, although formed, are imperfect, because we have not got the male tree in cultivation.

Besides the power of reproduction by seeds, plants have other modes of increasing themselves, viz. by offsets and suckers. And it is a remarkable fact that, in all cases where there is hazard of perfect impregnation by reason of the absence or distance between the male and female plants, or from the rigour of seasons, these kinds of plants are more prolific of viviparous progeny than others which yield great crops of seed. Instance the fig, the poplar and the English elm; these if unfertile in seed are lavishly productive of suckers.

Many plants reproduce or increase themselves both by seeds and suckers; and it is observable that these properties are excited more or less according as either predominate. If many seeds come to perfection, few or no suckers will be produced, and vice versâ. This circumstance is made available by practical men to procure whichever best suits their purpose of propagation. If a tulip or a hyacinth fancier wishes to increase his stock of bulbs, he must prevent the production of flower stems by cutting off the upper part of the old bulbs; this dismemberment will cause them to throw out an extra number of offsets from their bases. If on the other hand all offsets be displaced soon as they appear, both flowers and seed-vessels of the season will be correspondingly enlarged.

The same effect takes place in the management of tubers or other subterranean stems. Those of potatos, for instance, are increased both in size and numbers by divesting the plants of their flowers soon as they appear. The Jerusalem artichoke and horse-radish plants, rarely produce seeds, because their strength is exhausted by the production of progeny under ground.

The manner in which plants reproduce themselves viviparously, differs according to the constitutional character of the plant. Some, as the elm and poplar, are furnished with buds on their roots. These sooner or later sprout forth through the surface, and annually increase in bulk and height. Others, as the greater number of bulbs and tubers, multiply themselves by ejecting runners from the crown of the roots. Herbaceous perennials extend themselves in the same way, either by runners under ground as couch-grass, or above ground as the strawberry. Some yield living seeds from the vessel where they were matured, as is seen in some species of the onion family; and others, like some of the lilies, produce little perfect, bulbs in the axils of the stem leaves.

Another mode by which trees extend themselves from their first station, is by the points of their lower branches resting on the ground; these strike root, and thence send up a new birth of stems. This most frequently happens among trailing plants, as the bramble, &c. Another manner of extension is presented by the Banyan tree (*Ficus Indica*), which becomes enlarged without the assistance of either seed or suckers. Roots are produced from the under side of the lower branches; these hang dangling in the air for months before they reach the ground; this at last they penetrate; and become stems to a new head of branches. An old tree of this sort is a most magnificent object; forming concentric corridors over a great extent of surface, not more beautiful than useful in a tropical climate.

All these instances may be called natural reproduction; to which may be added the wonderful property of the leaves of some plants which, when fallen to the ground, put forth roots and become perfect plants. This phenomenon is exhibited by the Echeveria, malaxis, gloxinia, and others.

What remains to be advanced will be concerning artificial propagation. The first to be noticed is the expedient of propagating plants by layers: this is performed by simply bending a branch or shoot down into a hollow made in fresh broken up soil, confining there by hooked sticks, and covering it slightly with earth. It is usual to make some sort of incision on that part of the shoot which is buried, and which induces the exsertion of fibrous roots, which when sufficiently numerous and established in the soil, become the roots of the young plant, which then may be separated from the mother plant. It is by this means that the major part of ornamental shrubs and exotic trees are raised in public and private nurseries, when seed cannot be had, or if the kinds do not succeed by cuttings.

The shoots of many plants readily strike root and are propagated by cuttings. This is an easy and convenient process, and answers with many hardy, as well as tender exotic plants. Some practical judgment is required, as well in choosing the cuttings, as in placing them in suitable soil and in a proper temperature if they be exotics. There are, however, a good many estimable plants which cannot be readily propagated by either layers or cuttings. In such cases other expedients are had recourse to; and these are the various methods of budding and ingrafting. The practicability of these manœuvres depends on the congeniality of the respective kinds to be by these operations united. Their sap, membranes, and natural constitution must be similar, without which no intimate interjunction can take place. But as there are many inferior species and varieties of useful plants which serve well for stocks on which to graft superior sorts, the practice of grafting is of the greatest use in the business of propagation and culture of plants, whether for their fruit and flowers. And when the common modes of budding and grafting fail (as they sometimes do in the case of exotic trees), new plants are obtained by a particular method, called "inarching." By this plan, neither is the stock cut over, nor the shoot to be worked upon it, separated from its parent; but bringing the two in contact, and disbarking each at the junction, and binding the wounded surface closely together, a union takes place: after which the head of the stock is pruned off, and the inarched shoot is separated from the mother, being no longer dependent thereon.

A DAISY EXTRACTOR.

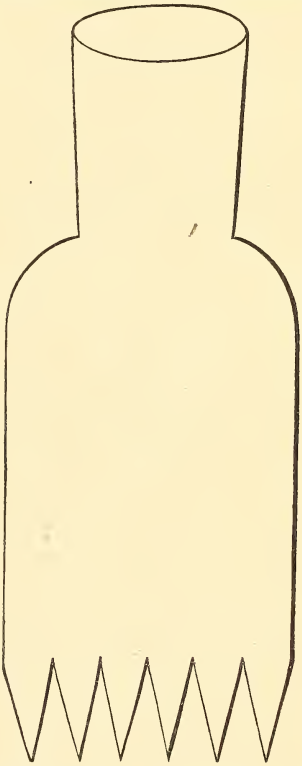
In winter, when the fields are bare, and all the weeds are shut up in their safe and quiet cells, beneath the sheltering turf, a bright warm day will seldom fail to lure abroad one or two of the aboriginal daisies, to cheer the casual footsteps of the wanderer who takes "a winter's walk at noon."

The little daring strangers find a welcome; then are their cheerful eyes greeted by equally charming eyes of childhood; and many a "Chaucer's darling" is brought in, to linger out its three days of beauty, among the groups of exotics, that decorate the vase upon the mantle-shelf.

But nipping frosts will yield to the influence of genial airs,—as a harsh spirit is subdued by gentleness; and then the fields are gay with flowers, and the erewhile friendly winter daisies come out in crowds, and the pasture that had been cheered, becomes not only disfigured, but spoiled by their *over population;* and now our lawns are daily mown with "daisy cutters," and are strewn with their heads in littering heaps: now too, the discovery of a more efficient mode of destroying the intrusive weed would be a "consummation devoutly to be wished;' and this is accomplished in the little instrument, of which a drawing and description is here given.

The desirableness of such a tool had long been obvious, the inefficiency of the "cutter" had been even more so; for the frequent decapitation of the heads increased the evil by strengthening their roots. These latter too, as is well known, ramify from a tough centre, and are with difficulty extracted from the soil.

A small spud hoe, about an inch in width, had been tried, and found to be ineffectual, since how deeply soever we might insert it, the ramifications remained, and they would sprout again; besides that, a sharp instrument would be likely to cut the roots of the surrounding grass. I therefore had a small spud made, with teeth of the annexed size and figure, which was fixed into a long handle: and with this little tool in the month of April last,—before the grass was shut up for hay, I used to amuse myself for hours, by raising the roots out of the turf, *entire.*



The settled drought of the spring prevented me from trying my skill upon the daisies on the lawn, because the bare spots left by the roots would have been unsightly, unless rain had immediately fallen, to nourish and cause the grass to grow, and cover them with verdure.

The plan is however perfect,—the occupation, to my taste,—the benefit essential,—and the employment, not only not fatiguing, but really not ungraceful. A walk in a spring meadow is thus rendered doubly delightful; for many a flower that would otherwise "be born to blush unseen," &c., is by this means brought into notice; a temptation to prolong a stroll is offered, and the *utile et dulce* are united. The bulbous rooted ranunculus (*buttercup*), the hawkweed, and others that afford a *fulcrum*, yield to this lever, for unless the ground be hard no fibre will remain.

The above was furnished us by a female correspondent to the "Horticultural Register," in which work it appeared, Vol. 3. p. 437.

OPERATIONS IN JANUARY.

AURICULAS may be top-dressed about the end, or beginning, of February, page 10, rule 6. Give them little or no water, until towards the end of the month; be also careful to preserve them from frost.

CAMELLIAS may be introduced into a temperature of from fifty to sixty degrees to bring them into flower, page 34.

DAHLIAS. A few roots may be plunged into old tan on a hot-bed for early flowering about the end, page 105, rule 12, and the seed may be sown at the same time, page 104, rule 6.

FORCING. Continue to take into the forcing houses lilacs in pots, pinks, carnations, hyacinths, and roses, the latter now placed in will produce flowers in March, page 144.

MIGNONETTE may be sown in pots about the end of the month, and be placed upon a very slight hot-bed; the best soil for the purpose is a light sandy loam, perfectly free from dung.

RANUNCULUSES, now planted in frames, will flower in April, page 45, rule 13. Also, about the end ranunculus seed may be sown, page 45, rule 15.

TULIP BEDS should be sheltered from excessive wet or snow, page 161.

INDEX.

A.

ABSCISSION, propagation of oranges by, 92
Aerides, culture of the genus, 15
Alder Tree, goat moth injurious to, 48
Aloysia citriodora, culture out of doors, 157
Alstrœmeria pelegrina alba, 192; culture of the genus, 199
Amaryllis formosissima, 149; Kermesina, 12; culture of the genus Amaryllis, 12
Angræcum eburneum, 258
Annuals, culture of the hardy kinds, 18; half-hardy, 19; tender, 20; selection of choice ones, 22
Andromeda, origin of the name, 164; culture of the species, 165
Anomatheca cruenta, 103
Appleby, Mr., on propagating by layers in pots, 92
Aporem anceps, 156
Apocyneæ, culture of, 97
Aquatic Plants, treatment of, 41
Arbutus, culture of the genus, 168
Aristolochia Clematitis, peculiarities of, 63
Auricula, general culture of, 9; mode of packing, 12
Azalea Danielsiana, 129; pulchra, 126; culture of all the tender species and varieties, 126; of the hardy, 127

B.

Banksia, culture of the genus, 120
Barton (Dr.) on the irritability of the Dionœa, 62
Berberis vulgaris, irritability of the stamina of, 62
Biennials, culture of greenhouse species, 66; stove, 67; selection of choice ones, 67
Bischoff (M.) on the spiral vessels of plants, 58
Bletia Tankervilliæ, culture of, 96
Bonnet (Mr.) his definition of a plant, 32
Boronia serrulata, 173
Bouvardia triphylla, 225
Braconnot (M. Henry) on labelling plants, 183; notice of his converting rags into sugar, 183
Brown (Mr.) plan of a flower garden by, 154
Brunsvigia, culture of, 163; poison obtained from, by the Indians, 164
Bulbs, treatment of, in pots and glasses, 41
Butomeæ, culture of, 121
Bygrave Plant preserver, 17
Bygrave slug preventer, 17

C.

Cacti, culture of the stove species of, 49; grafting of, 51
Calandrinia grandiflora, 222
Calceolaria bicolor, culture of, 246
Calceolaria integrifolia viscosissima, 269
Calendar of work to be done in the flower garden in January, February, 23; March, 39; April, 75; May, 100; June, 123; July, 148; August, 172; September, 196; October, 219; November, 244; December, 266
Calochortus venustus, 175; luteus, 221
Campbell (Mr.) his observations of the Nepenthes, 58
Camellia, culture of, including potting, 33; temperature, 33; summer quarters, 33; shading, 34; watering, 34; winter quarters, 34; cause of casting their buds; grafting, 35; inarching, 36; budding, 36; insects, 38; selection of choice varieties and species, 38
Cantau aggregata, 27
Caralluma fimbriata, 216; culture of the genus, 216
Cape Heaths, culture and propagation of, 113
Carnation, criterion of a good one, 68; divisions of, 68; propagation by seeds, 69; soil, 69; potting, 70; care necessary when flowering, 70; layering, 71; winter quarters, 72; propagated by pipings, 73; insects, 73
Cappaideæ, culture of, 122
Cattleya intermedia, 151; culture of the genus, 151
Cephalotus follicularis, 59
Cirrhæa Warreana, and other species, 15
Chairs for the flower garden, by Mr. Saul, 123, 220
Cinnamon tree figure, 147; culture of, 147
Chrysanthemum, history and culture of the Chinese, 187; list of sorts cultivated, 189; an arrangement by A. H. Haworth, Esq., 189
Citrus, culture of the genus, 88
Cleome dendroides, 122; culture of the genus, 122
Clethra, culture of the genus, 233
Corbett's (Mr.) system of destroying slugs, 16
Combretum grandiflorum, 14; culture of the genus, 14
Cottages, ornamental, designs for, 251
Cratægus oxacantha rosea superba, 198

Crinum, culture of the genus, 99
Crinis Peruvianus, 173
Crocuses, culture of, 201; species and varieties of spring enumerated, 202
Currants, red-flowering, 3; changeableness of, 3; yellow-flowering, 4
Cuttings, plan of a house for striking, 111
Cychnochis Loddigesii, 14
Cyclamen, culture of the genus, 180
Cyclobothra alba, 98; pulchella, 98

D.

Dahlias, impregnation and propagation from seed, 104; treatment of old roots, 105; root grafting, 105; propagation by cuttings, 105; soil for, 106; staking, 106; taking up, 107; criterion of a good one, 107
Daisy Extractor, 273
Dendrobium, culture of the genus, 15
Dianthus barbatus, or Sweet William, 67; hybridus, or mule pink, 67; caryophyllus, or carnation, 68; plumarius, or common garden pink, 74
Dionœa muscipula, its peculiar irritability, 54; experiments upon, by Mr. Knight, 61; Dr. Barton's opinion respecting, 62
Dipsacus fullonum, 60
Distinctions betwixt plants and animals, 32
Drosera, the supposed irritability of the species explained, 62; peculiarities in the time of flowering noticed, 62
Dryobalanops camphora, 243
Dutrochet's discovery of a supposed nervous system in plants noticed, 31

E.

Echites, culture of the genus, 97
Ellis (Mr.) observations of, on the Dionœa muscipula, 61
Enkianthus, culture of the genus, 232
Epacris grandiflora, 52; culture of all the Epacrideæ, 53
Epiphyllum splendidum, 49; culture of Cacteæ, 49
Erica, natural habitats of some species, 236; soil, 236; propagation, 237; general culture, 237; Mr. M'Nab's system, 238; propagation of, by Mr. Forbes, 113

F.

Ferns, culture of the stove species, 171
Flower Garden, plan of a, 154, 184
Forbes (Mr.) mode of propagating Cape heaths, by, 113
Forcing houses, different modes of heating, 135
Francoa sonchifolia, 254; culture of the genus, 235
Francisea Hopeana, 80
Fumigation, destroying insects by, 24

G.

Galangale, round-rooted, 125
Garden chairs, figured, 123, 220
Gardenia florida, 226; radicans, 227
Gas furnace, Witty's improved, recommended, 132; figured, 133
Gate lodge for a country residence, 178
Gaultheria, culture of the genus, 160; Shallon produces abundance of honey, 160
Gesneria Suttoni, 13; Cooperi, 224; culture of the genus, 13
Geometrical flower-garden, plan of a, 154, 184
Gilia Achillæfolia, 150; aggregata, 27; pulchella, 27; tricolor, 150
Ginger, culture of, 200; mode of preparing the roots, 200
Gladiolus, culture of the genus, 97
Glazing, Mr. Saul's mode of, 130; Mr. Harrison's, 131; various objections to, 131
Gloriosa superba, 97
Goat moth, figured, 48; the injury it does to trees noticed, 48
Grafting, various modes of noticed, 93
Graham, Dr., on the water in the pitchers of Nepenthes, 58
Greenhouse, cost of fitting up, 130; management of, 137
Griffinia, culture of the genus, 233
Guava, culture of the, 119

H.

Haworth, A. H. Esq., division of the genus Narcissus, 118
Heart's Ease, 116; properties of a good one, 117
Heaths; culture of the Cape species, 113; natural habitats of some, 236
Heating by hot water, cost of, 134; Mr. Saul's mode, 136
Hedwig, M., definition of a plant by, 32
Hermodactylus longifolius, 242; culture of the genus, 241
Hibiscus Lindlei, 77; ficuloides, 77; mutabilis, 77; racemosus, 77; culture of the genus, 77
Hogg on soils for flowers, 9
Hollies, proper time to plant, 46
Hot-water apparatus, 134, 136
House for striking cuttings, 111
Hyacinths, treatment of in pots and glasses, 41

I.

Indian daffodil, 149
India, preparation and management of plants during a voyage from, 263
Introduction, 1
Ipomopsis elegans, 27; picta, 245; culture of the genus, 28
Iris bifolia, 245; culture of the genus Iris, 82; uses of, 83
Irritability of plants, 31, 54
Ismene Amancaes sulphurea, 96
Ixia Heleri, 8; flexuosa, 8; viridiflora, 8

J.

Jack, Dr., Pitcher of Nepenthes examined by, 58
Jacobea Lily, 149
Jesse, E. Esq., mode of planting large trees by, 46
Jungius, M., definition of a plant by, 32
Justicia coccinea, 102

K.

Kæmpferia rotunda, 125
Keith, Mr., definition of a plant by, 32
Kennedia rubicunda, culture of, 88
Knight, Mr., experiments made with Dionœa muscipula by, 61

L.

Labels for plants made of rolled zinc, 155, 183; of lead, 124
Layering the orange, 92
Lemon Tree, time of introduction of the, 88
Leucopogon, culture of the genus, 53
Liliaceæ, new, 98
Lilio-Narcissus Jacobeus, 149
Limnocharis Humboldti, 121
Linnæus, Dr., definition of a plant by, 32; observations on the pitchers of Nepenthes, 57; on Dionæa muscipula, 60
Lodge for the gate entrance to a country residence, 178
Lucas's self-acting force and lift-pump, 156
Lysinema, culture of the genus, 53

M.

Malope trifida, 177; trifida grandiflora, 177
Marcet, M., experiments on mineral and vegetable poisons by, 32
Marcgraavia, 60
Marica Sabini, 81; cærulea, 128; Northiana, 81; semi-aperti, 81
Marnock, Mr., cultivation of stove ferns by, 171
Maxillaria, culture of the genus, 228
Metallic poisons, effects of on vegetation, 32
Mice, to destroy in the flower-garden, 24
Mimulus roseus, 29; Smithii, 54; origin of, 79; variegatus, 79; floribundus, 29; parviflorus, 29; rivularis, 30; moschatus, 29; irritability of stigma noticed, 29; culture of the genus, 29
Mirbel, M., definition of a plant by, 32
Murphy, Mr., remarks on the Sarracenia by, 33
Musical dial fountain, description of, 259

N.

Narcissus, culture of the genus, 117
Nepenthes distillatoria, 54; pitcher, figured, 57; supposed uses of, 57; culture of the genus, 58
Nervous system in plants, 31

O.

Octomeria graminifolia, 156
Œnothera, origin of the name, 86; uses of the species, 87; culture of the biennial species, 87; perennial, 87; peculiarities in the opening of its flowers, 87
Olive Tree, culture of the, 253
Oncidium bifolium, 234; culture of the genus, 233
Operations for January, February, 23; March, 39; April, 75; May, 100; June, 123; July, 148; August, 172; September, 196; October, 219; November, 244; December, 266; January, 274
Opuntia Tuna, irritability of, 63
Orange, culture of, including history, 89; propagation by seeds, 90; cuttings, 91; layers, 91; abscission, 92; budding, 93; grafting and inarching, 93; compost, 94; temperature, 94; watering, 95; pruning, 95; insects, to destroy, and diseases to cure, 95
Orchideæ, new and beautiful species noticed, 14; culture of, 41, 151, 262
Oxalis, uses of, 229; culture of, 229

P.

Pancratium pedalis, 13; culture of the genus, 13
Passiflora Kermesina, 25; quadrangularis, 26; alata, 26; maliformis, 26; vespertilio, 26; fœtida, 26; rubra, 26; culture of the genus, 25
Peculiarities of plants, 29, 54
Pæonia edulis Reevesiana, 197
Petunia violacea, 7
Phlox cordata grandiflora, 268
Pink, culture of, 74; criterion of a fine one, 75
Plan of a cutting-house, 111; flower-garden, 154, 184
Planting trees for ornament, 46
Plants, to preserve choice ones from slugs, 16; treatment of, in rooms, 39; causes of their dying, 39; remarks on those which possess the power of catching flies, 54; irritability of, 31; nervous system of, 31; effects of poisons on, 31; definitions of, 32; reproduction of, 270
Poison bulb, 164; effects of poisons on plants, 31
Polianthes tuberosa, 166
Polyanthus, general culture of, 108; selection of choice ones, 111
Pomegranates, culture of, 64; causes of barrenness, 64; history and introduction of, 64; pruning, 65; grafting, 65
Ponceletia, culture of the genus, 53
Potentilla, culture of the genus, 170
Primula vulgaris, 108; Sinensis, or Chinese Primrose, 181
Protea, culture of the genus, 231
Prussic acid, effects of on plants, 31
Psidium Cattleyanum, 119
Pulteney, Dr., opinions on the Ranunculus aquatilis by, 42
Pump, Lucas's self-acting, 156

R.

Rafflesia Arnoldi, 153
Ranunculus aquatilis, uses of, 42 ; Asiaticus to raise from seed, 45 ; mode of culture, 43 ; taking up, 44 ; stand for preserving, 44 ; criterion of a good one, 46 ; Parnassifolius, 42
Renanthera coccinea, 15
Reproduction of plants, 270
Rhododendron arboreum, 101 ; pulchrum, 126 ; indicum Smithii, 126
Ribes sanguineum, 3 ; aureum, 4
Rockets, culture of, 108
Ronalds, Mr., propagating house by, 111
Rondeletia speciosa, 158 ; culture of the genus, 158
Roses, culture of, 138 ; selection for training against a wall, 144 ; forcing, 144 ; retarding the blooming of, 144 ; diseases, 145 ; chemical analysis of the sap, 146
Rumphius, observations by, on the pitcher of Nepenthes, 57

S.

Sabine, Joseph, Esq., division of spring crocuses by, 202
Salisbury, R. A. Esq., on the introduction of the tuberose, 166
Sarracenia, remarks on, by Mr. Murphy, 54 ; Sir J. E. Smith, 55 ; leaf of S. flava, figured, 55 ; culture of the genus, 56
Schizanthus retusus, 5 ; pinnatus humilis, 6 ; Priestii, 31 ; general culture of the genus, 5
Scraper for the garden, 75
Scutellaria macrantha, 235 ; culture of the, 235
Selection of annuals, 22 ; of biennials, 67 ; of camellias, 38
Sensibility of plants, 31
Sensitive plant, 31
Shrubberies, planting of, 46
Siebe's patent syringe, 23
Silene laciniata, 267
Slugs, to preserve choice plants from, 16
Smith, Mr. plan of a flower-garden by, 184
Smith, Sir J. E., remarks by, on the Dionœa muscipula, 61 ; on the Sarracenia, 55
Sparaxis lineata, grandiflora, tricolor, 8
Sprekelia formosissima, 149
Stock, double, caused by disease, 240
Strawberry tree, 168
Streptanthera cuprea, 8 ; elegans, 8
Styphelia longifolia, 53
Subscription gardens, design for forming, 211
Succulent plants, treatment of, 41
Sundew, peculiarities of, 62
Sunflower, a popular fallacy respecting, 217
Surrey Zoological Gardens, 184
Sweet William, culture of the, 67

T.

Tacsonia pinnatistipula, 249
Tallies for plants made of rolled zinc, 155, 183 ; of lead, 124
Tigridia pavonia, culture of the, 85
Trevirana coccinea, culture of, 169
Treviranus, M., observations on the nepenthes by, 58
Trees, planting for ornament, 46 ; deciduous, 46 ; evergreen, 46 ; apparatus for removing, 47 ; supporting, 47
Trichonema rosea, 8
Tropæolum majus atrosanguineum, 176
Tuberose, history and introduction of, 166 ; culture of, 168
Tulip, history of, 160 ; propagation by seeds, 161 ; offsets, 161 ; treatment of flowering bulbs, 161 ; taking up and preserving, 162
Turner, Dr., observations on the water in the pitchers of Nepenthes by, 58

V.

Valentine, Mr., on the spiral vessels in the petioles of Nepenthes, 58
Vegetable poisons, effects of, on plants, 32, 54
Verbena Melindres, 173
Vieusseuxia glaucopis, 18
Viola tricolor, culture of, 116
Violets, culture of, 115, 122

W.

Wire-worm, modes of destroying, 74
Witty's patent gas furnace, 133 ; Mr. Wilmot's opinion of its advantages, 134 ; Mr. M'Intosh's, 134

Z.

Zedoary of commerce, 125
Zinc, writing on with common ink for tallies, 155 ; new mode, by M. Braconnot, 183
Zingiber Officinalis, culture of, 200
Zinnia violacea coccinea, 223
Zoological Gardens, Surrey, 184

LONDON:
BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.

SMITHSONIAN INSTITUTION LIBRARIES

SMITHSONIAN INSTITUTION LIBRARIES

BOUND BY HNM